The transformation of higher learning 1860-1930: expansion, diversification, social opening and professionalization in England, Germany, Russia and the United States

Jarausch, Konrad H. (Ed.)


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Heinrich Best, Wolfgang Bick, Paul J. Müller,
Herbert Reinke, Wilhelm H. Schröder

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Konrad H. Jarausch (ed.)

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Preface

The debate about the current (or perhaps perennial) crisis of higher education suffers from a lack of temporal and comparative perspective. Concerned with solving immediate policy problems, scholars and administrators tend to argue as if their present predicaments were unique. However academic unemployment, curricular disintegration, inequality of opportunity and vocationalism are neither particularly new nor limited to the United States. While the past cannot merely be used as a quarry for building blocks for the future, and comparisons, if superficial, mislead more than enlighten, both can provide a clearer awareness of the dynamics of change which underlie some of the recent difficulties. Although the last great upheaval which produced mass higher education has dwarfed all previous developments, many of its problems of size, institutional structure, social composition and professional orientation have resulted from the prior change from a traditional to a modern system around the turn of the century. Hence a closer look at the patterns, causes and consequences of that transformation of higher learning in the West suggests a broader as well as a longer view on the antecedents of the recent malaise and a more critical sense of the connection between education and social change.

The present volume attempts to build upon the new social history of higher education. Lawrence Stone's pathbreaking enterprise at the Shelby Cullom Davis Center for Historical Studies, which produced *The University in Society* and *Schooling and Society,* demonstrates the utility of the collaborative approach but unfortunately lacks tight interpretive integration. Fritz K. Ringer's pioneering work on *Education and Society in Modern Europe* illustrates the feasibility of quantitative comparisons but is limited by the categories of published statistics and cannot do justice to all countries involved. The challenging "state of the art" issue of the *Comparative Education Review* presents an instructive survey of social science concepts, but is weakened by presentism, policy study orientation and third worldism. Therefore this volume employs a cooperative approach, which attempts close coordination, seeks to present some primary statistics and tries to provide an interdisciplinary historical perspective. By concentrating on four important countries such as Britain, Germany, Russia and the United States as well as on four overriding topics such as expansion, diversification, social opening and professionalization, it focuses both on the common dynamics of the transformation and individual national peculiarities. Therefore,

this volume can be read in both directions. However, a collective effort seldom leads to complete homogeneity. Instead it can offer a variety of narrative and analytical styles, quantitative and qualitative methods or intellectual and social argumentations. The combination of such different countries and topics also reveals research disparities which suggest directions for future work. Given the impossibility of harnessing a talented group of scholars permanently to one common pursuit, one can only hope that where this volume has fallen short of answering its central questions, others will be inspired to begin.

A collaborative undertaking incurs many debts from individuals and organizations. First, I would like to acknowledge the patience of the contributors in perservering through the various stages of the project. The initial drafts of the papers were discussed during a conference on "Education and Social Change" at the University of Missouri in Columbia from March 6 to 9, 1980. The chapters then were extensively revised in order to make them topically comparative and nationally cohesive as well as edited for uniformity and shortened rigorously. Second, I would like to thank the National Endowment for the Humanities and Dr. D. Wise for funding the conference and to express my gratitude to the Deutsche Forschungsgemeinschaft for supporting the West German contributors. The University of Missouri Research Council graciously financed the index. Third, I am grateful to a number of scholars, such as MU President James Olson, who provided a thoughtful introduction, the session chairmen Jurgen Herbst (University of Wisconsin), Hartmut Kaelble (Freie Universität Berlin), who sent a stimulating comparative essay, and Harold Perkin (University of Lancaster) as well as to an exceptionally informed audience. Professor Detlev K. Müller contributed a provocative conference paper but was so kind as to ask his collaborator H. Titze, a specialist on higher education, to write the German expansion chapter. Fourth, I am indebted to several individuals such as Freddy Randolph for handling the conference arrangements, Jeff Fox for the editing and Phyllis Dussel for the typing of the manuscript. Fifth, Dr. Dietrich Kerlen of the Klett-Cotta Verlag expertly guided the production job, while John Tryneski patiently conducted the co-publication negotiations for the University of Chicago Press. Finally, I am also thankful to Dr. Paul Müller and the entire board of QUANTUM for their persistent support of international cooperation among quantitative historians. Although the book analyzes the transformation of the traditional into the modern system of higher learning, the spirit which animated the collaborators is a tribute to that older scholarly ideal formulated by Wilhelm von Humboldt, which defines *Wissenschaft* as an "unsolved problem" never to be grasped completely, but "to be pursued unceasingly."

Washington/Columbia, March 1981

Konrad H. Jarausch

Higher Education and Social Change: Some Comparative Perspectives

Seemingly self-evident, the relationship between higher education and social change has proven elusive. Social scientists have tended to focus on the practical reform of both according to some normative conception, often oblivious to the disappointments of the past. Historians who dared address that numinous monstrosity called "modernization" have usually ignored education or treated it as a dependent variable despite the insistence of many 19th century observers that it was a significant promoter of change.[1] Those who have taken a closer look have been disappointed in their effort to determine the general contribution of schooling to industrial development, unless they have focused more specifically on technical training. Others who have pondered the transmission of values have stressed the "actively incongruent" role of higher learning in social upheavals based upon the largely traditional content of the curriculum.[2] Part of this confusion results from an excessively narrow view of social change, limited by and large to industrialization. From a broader Weberian perspective, which includes rationalization, bureaucratization and professionalization as key processes, the role of education in the transformation of traditional society looms much larger. Instead of a simplistic alternative which defines schooling as either the passive product of society or the active motor of progress, the relationship between higher education and social change is circular and interdependent with both transforming each other. Not a deductive theoretical approach (be it functionalist or Marxist), but an inductive empirical study of one phase of their interaction is therefore likely to yield clearer insights, as long as it is sufficiently systematic and general.[3]

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1. R. G. Paulston, "Social and Educational Change: Conceptual Frameworks," *Comparative Education Review*, 21 (1977), 370-395; H. U. Wehler, *Modernisierungstheorie und Geschichte* (Göttingen, 1975); P. N. Stearns, *European Society in Upheaval* (New York, 1975), 2nd ed.
2. P. Lundgreen, *Bildung und Wirtschaftswachstum im Industrialisierungsprozeß des 19. Jahrhunderts* (Berlin, 1973); F. K. Ringer, *Education and Society in Modern Europe* (Bloomington, 1979).
3. P. V. Meyers, *The Modernization of Education in 19th Century Europe* (St. Louis, 1977) is but a brief sketch; H. U. Wehler, "Vorüberlegungen zu einer modernen deutschen Gesellschaftsgeschichte," in *Industrielle Gesellschaft und politisches System* (Bonn, 1978), for M. Weber's

One such "seismic shift" is the emergence of "modern" higher education between the middle of the 19th and the first third of the 20th centuries. During the development of a mature industrial society, a small, homogenous, elite and pre-professional university turned into a large, diversified, middle-class and professional system of higher learning. While its antecedents in the late 18th century involve practical enlightenment as well as idealist neohumanist reforms, the major alterations in size, institutional structure, social composition and career pattern of graduates took place after initial industrialization before they were interrupted by the Great Depression and the Second World War. But from the perspective of mass higher education during the middle of the 20th century, these changes in higher learning were still limited by institutional tradition and social constraints.[4] Because the sequence, intensity and manner of this central transformation differed in various highly industrial countries of the West, a comparison can help isolate the relative importance of various causes. The British experience of industrialization preceding educational mobilization contrasts sharply with the German pattern of higher learning before economic growth, with the Russian sequence of both developments imported in the Central European mold and with the American way of both coinciding in time. Despite considerable differences in cultural style, institutional tradition and educational policies, certain developments, such as increases in size and complexity of institutions, cut across national frontiers and modernized higher learning in all countries of the West. Hence it is imperative to distinguish the common pattern from national peculiarities and vice versa.[5]

In order to gain greater explanatory depth, such an analysis has to be limited in several respects. The focus on higher education, defined loosely as post-secondary schooling beginning at age 18, provides a distinctive subject matter with clear boundaries. The common social approach to scientific research, liberal education or training contributes greater cohesion, even if the methods vary from intellectual to quantitative history. Interdisciplinary perspective produces a methodological tension between historicist attention to the particular and social scientist penchant for generalization or modeling.[6] Among the variety of issues, four themes seem to represent cru-

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view of modernization; H. Gerth and C. W. Mills, *From Max Weber: Essays on Sociology* (New York, 1958).

4. L. Stone, "Introduction," in his *The University in Society* (Princeton, 1974) 2 vols. and the successor collection on *Schooling and Society* (Baltimore, 1976); for a similar periodization Stearns, *European Society,* 179ff; Ringer, *Education,* 52ff. The mid-19th century offers a convenient starting point also because statistics become more available and reliable while the Second World War disrupted time series or changed their units drastically.
5. France was excluded for reasons of space and dissimilarity of institutions (i.e., no universities until the late 19th century), A. Prost, *Histoire de l'enseignment en France 1800–1967* (Paris, 1969). For similar comparative attempts, P. Flora, *Quantitative Historical Sociology* (The Hague, 1977); H. Kaelble, *Historische Mobilitätsforschung* (Darmstadt, 1978); Ringer, *Education and Society,* passim.
6. For the social history of education, E. Rury, "Elements of a 'New' Comparative History of Education," *Comparative Education Review,* 21 (1977), 342–51; H. Graff, "'The New Math,' Quantification the 'New' History and the History of Education," *Urban Education,* 11 (1977), 403–40 and the discussion at the History of Education Society Meeting at Washington in November 1979.

cial aspects of the transformation. First, the absolute and relative expansion of enrollments provides a basic numerical indicator of the spread of higher learning and of the growth of its social importance. Second, institutional diversification approaches the internal differentiation of universities in terms of teaching subjects and research institutes as well as the proliferation of institutions in the technical and commercial fields. Third, the opening of recruitment raises the question of educational elitism or mobility during the second half of the 19th century and examines the university in terms of its societal clientele. Finally, the process of professionalization analyzes the relationship between institutionalized learning and the spread of the professions in terms of their scientific bases, practical training or state credentialling. While any number of other problems, such as scientific progress, educational finances or university governance, could also have been discussed, these four dynamic processes emphasize change and facilitate comparison.[7]

Although American academics are sometimes defensive and hesitate to investigate their own institutions, their continental colleagues at the turn of the century were convinced of their own importance:

> The greatly admired level of civilization in Germany is living proof of the immeasurable value of the universities. Did not the culture which has now spread through every stratum of society issue chiefly from this primary and most copious source? More importantly this is where the great discoveries in the natural sciences were made, to whose practical application communication and commerce owe their progress. Here the principles of the rule of law were developed and taught. Here the moving ideas of economic progress were conceived, which public life struggles to implement. Here the spirits have matured who have succeeded in grasping the great truths of present and past reality and by teaching have made them the intellectual property of the people. Did not the universities nurture the spark of patriotism and of political honor in the darkest hours? Did not the salvation of the fatherland proceed from the universities in the hour of greatest need?

Somewhat exaggerating the active impact of higher education on society, contemporary self-consciousness demonstrates that for professors and students alike higher learning involved the spread of civilization, the advancement of science and the propagation of modern nationalism.[8] Seen in a broader context, the history of higher education is too important to be left to the vagaries of anniversary tributes to yet another illustrious alma mater. Instead it needs to be firmly integrated into the general discussion of social change in order to determine the university's contribution to "modernization" as well as to the perpetuation of traditional elites, values and styles.[9] Although the "most important questions" concerning not only arrangements

7. The topics emerged out of K. H. Jarausch, "The Social Transformation of the University: The Case of Prussia, 1865–1914," *Journal of Social History*, 12 (1979), 609–636; "Frequenz und Struktur. Zur Sozialgeschichte der Studenten im Kaiserreich," in P. Baumgart, ed., *Bildungspolitik in Preußen zur Zeit des Kaiserreichs* (Stuttgart, 1980), 119–149.
8. A. Langguth, "Bilanz der akademischen Bildung," *Burschenschaftliche Bücherei* (Berlin, 1901), 1, 303–64; C. E. McClelland, *State, Society and University in Germany, 1700–1914* (Cambridge, 1980).
9. M. Steinmetz, "Laufende Arbeiten zur Geschichte der Universitäten und Hochschulen auf dem Territorium der DDR," paper delivered at the meeting of the International Commission on the History of Universities at the XV. International Congress of Historical Sciences in Bucharest, August 11–12, 1980; for the disparate state of the field see the 19 resumes of the

but also purposes deal mostly with intangibles, a comparative framework for the study of higher learning requires, whenever possible, quantitative answers, marrying social, as it were, to intellectual history.[10]

The Dynamics of Expansion:

A basic index of the internal structure and external influence of a system of higher education is its enrollment. "Major changes in the size of the student body are the structural pivots around which the history of the university has to be built," since large scale swings of attendance "not only have obvious and far-reaching effects on the economics, the architecture and the teaching arrangements of the university, they also have profound repercussions on its intellectual life." Because institutional figures and government statistics are often inflated, a first task is the reconstruction of the pattern of expansion in each of the four countries concerned. Previous attempts to measure absolute or relative growth have encountered three particular difficulties: Comparisons based on highly aggregated figures tend to be unreliable, if not misleading, because of varying degrees of inaccuracy and incompleteness of the numbers on which they are based. More sophisticated efforts have been frustrated by the unit of measurement problem of which institutions (and consequently students) should or should not be included in "higher education." Finally, cross-national comparisons built on age-cohort representation indices have found it difficult to focus on comparable spans of years among the population as base.[11] Fortunately these obstacles can be partially overcome by reaggregating data in individual settings from below, by defining higher learning not only legally (according to government practice) but also functionally (as post-secondary) and temporarily (18-year-olds and above) and by calculating the index of inclusiveness on the basis of empirically determined average length of study which is then compared to the relevant age group. The fragmentary evidence suggests three overriding questions: What was the absolute growth in student numbers? Which types of institutions contributed to it? How did the expansion of higher learning relate to population increase?

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communications by the participants at the congress, printed in *Rapports* (Bucharest, 1980), 3: 323-360.

10. K. H. Jarausch, ed., *Quantifizierung in der Geschichtswissenschaft. Probleme und Möglichkeiten* (Düsseldorf, 1976); M. Kaplan, "The Most Important Questions," *Oxford Review of Education*, 3 (1977), 87-94; G. Iggers, *New Directions in European Historiography* (Middletown, 1975); J. Kocka, *Sozialgeschichte* (Göttingen, 1977); J. Henretta, "Social History as Lived and Written," *American Historical Review*, 84 (1979), 1293-1333.
11. Stone, "The Size and Composition of the Oxford Student Body 1580-1909," *University in Society*, 1: 22ff; C. E. McClelland, "A Step Forward in the Study of Universities," *Minerva*, 14 (1976), 150-161; F. K. Ringer, "Problems in the History of Higher Education," *Comparative Studies in Society and History*, 19 (1977), 239ff; Flora, *Quantitative Historical Sociology*, 56ff; Ringer, *Education and Society, passim*; H. Kaelble, "Educational Opportunities and Government Policies: Postprimary European Education before 1914," in P. Flora and A. J. Heidenheimer, eds., *The Development of the Welfare State in Europe* (New Brunswick, 1981).

In all four countries student numbers rose so dramatically during the three-quarter century that higher learning multiplied at an average of ten times (Table 1).[12] The

Table 1: Absolute University Enrollment

country:	Britain		Germany		Russia		United States	
year:	stud.	univ.	stud.	univ.	stud.	univ.	stud.	univ./col.
1860/1	3,385	5	12,188	20	5,000	9	22,464	
1870/1	5,560		13,206		6,538		31,900	560
1880/1	10,560		21,209		8,045		49,300	
1890/1	16,013		28,621		13,169		72,250	
1900/1	17,839		33,739		16,357		100,000	
1910/1	26,414		53,364		37,901		144,800	
1920/1	34,591		86,367		109,200		251,750	
1930/1	37,255	16	97,692	23	43,600	21	489,500	1,400
growth:	11 times		8 times		9-22 times		22 times	

Note: British figures include both Old Universities and New Provincial Universities. German figures are for the Empire (less Strassburg after World War One) and include only universities. Russian figures include Warsaw and Dorpat until World War One. Because there is no precise American equivalent to the European university sector, an approximate estimate of U.S. dynamics was based on one half of the enrollment in colleges and universities together with the entire enrollment in the professional schools, since these were clearly of university-like status and function. The U.S. figures were computed from informed estimates of the college/university, professional school, and normal school/teacher's college enrollment, provided by C. B. Burke. Since they were for males in 1860 and for both males and females thereafter, they somewhat overstate expansion.

most rapid decades of growth were the 1870s and 1880s as well as the last pre-war years and once again the 1920s. While the German universities, with the highest level of initial attendance, expanded more slowly, Russian and British institutions grew strongly, and American colleges increased astoundingly since their students were younger and academic standards were less rigorous. Despite this considerable increase in the traditional university sector, the newer forms of higher education mushroomed even more quickly, 13-17 times in relatively restrictive Britain and Ger-

12. Tables 1 to 3 are based on the essays of R. Lowe, H. Titze, P. Alston and C. Burke as well as on Ringer and Kaelble, cited in N. 11; the German figures are from R. Riese, *Die Hochschule auf dem Wege zum wissenschaftlichen Großbetrieb* (Stuttgart, 1977), 339ff; C. Quetsch, *The Numerical Record of University Attendance in Germany in the Last Fifty Years* (Berlin, 1961), 51; K. H. Manegold, *Universität, Technische Hochschule und Industrie* (Berlin, 1970), 320f; W. Hoffmann, *Das Wachstum der deutschen Wirtschaft* (Berlin, 1965), 172ff.

many, and 36–66 times in the more inclusive American and Russian systems (Table 2). Much of this dynamism was due to the explosion of higher technical education and to the expansion of teacher training, which slowly reached equality with older disciplines and institutions. Even relative to the population (which doubled in this period) the expansion was still so substantial that one is tempted to call it an educational mobilization, since it not only reflects demographic growth but goes considerably beyond it (Table 3). The century-long contraction of higher education was arrested in the first decades of the 19th century; but only after 1850 did this reversal turn into sustained educational growth. Not surprisingly the most limited system was the British with only about 1.9% of the 20- to 24-year-old cohort enrolled in higher education. By 1930 the Germans were still somewhat more inclusive at 2.61% of the same age span, while the Russian spurt after the 1905 revolution and then again in the early and late 1920s raised the levels of inclusiveness to 4.3% of the age group in 1939. With the most open and varied structure, the United States was clearly ahead of all other developed nations with 11.25% of a 5-year age cohort going to college, graduate or professional school. Hence the German and British rates of increase were the lowest (five to six times), the American, starting at a higher level, somewhere in the middle (6.5) and the Soviet, calculated in terms of proportion among 10,000 of the population, the most dramatic (14), since they had the furthest to go. This substantial, but still limited, expansion beyond population growth made higher education accessible to a considerably larger segment of the relevant age group.[13]

Contemporaries already speculated about the causes of "this rapid increase in the number of our students." While academic boosters invoked "progress" or "democratization," statisticians offered "the high social esteem" of college graduates, "the universal spread of classical culture" and the "commercial depression" as reasons.[14] Although their relative weight differed according to context, about a handful of direct and indirect factors seems to have been involved. (1) While in Germany growth mainly occured in already existing institutions, in Britain (trebling), Russia (doubling) and the United States (more than doubling) a considerable part of the expansion was due to the foundation of new colleges and universities. (2) Especially important for the increase beyond population growth was the lowering of admissions barriers which allowed women (from 1/5 to 1/2 of the system by 1930), graduates of

13. Since the British indices of Kaelble and Lowe dovetail, they seem credible (except for Kaelble's sudden jump between 1910 and 1920, which is likely to be based on a difference in inclusion of institutions). Ringer's, Kaelble's and Jarausch's German figures roughly coincide (when one makes allowance for the differential age-spans), but Jarausch's emphasize greater dynamism. Although there are no comparable figures for Russia from other authors, the index compiled by P. Alston rests on a comparison of students with 20–24 year olds. While widely used, the proportion of students per 10,000 of population tends to be misleading, since the composition of various populations is likely to differ in age and therefore the comparable cohort is not always the same size. The trend direction of all U.S. figures is similar; Burke's are the most inclusive, consistent over time, self-compiled and also reliable.

14. H. von Petersdorff, "Der Zudrang zu den Deutschen Hochschulen," *Akademische Blätter*, 4 (1888/9), 3f; J. Conrad, *German Universities during the Last Fifty Years* (Glasgow, 1885), 19ff; F. Eulenburg, *Die Frequenz der deutschen Universitäten von ihrer Gründung bis zur Gegenwart (Leipzig, 1906), 250ff.*

Table 2: Non-University Higher Education Enrollment

country/ year	Britain Tech.	Britain Teach.	Britain Tot.	Germany Tech.	Germany Teach.	Germany Tot.	Russia Tech.	Russia Teach.	Russia Tot.	United States Coll/Un.	United States Teach.	United States Tot.
1860/1		2,129		2,187	(3,610)		(3,750 est.)			8,300	2,000	10,300
1870/1		2,527		3,957	(5,008)					20,000	9,900	29,900
1880/1		3,002		4,822	(9,892)		7,120			27,000	41,000	68,000
1890/1		3,126		6,594	(10,553)					39,750	45,500	85,250
1900/1		6,951		13,970	(11,648)		9,538			52,000	76,000	128,000
1910/1	3,024	12,257		14,884	(17,854)		30,990			78,800	131,300	210,100
1920/1	5,434	21,882		23,089	(9,039)	40,433	180,800			184,750	161,500	364,250
1930/1	8,030	20,924	28,954	22,890	3,200	37,199	247,300		247,300	391,300	293,600	684,900
			13 times			17 times			66 times			66 times

Note: British figures include technical training in day institutes which eventually turned into colleges and teacher education. German figures are based mainly on technical colleges but include all other Hochschulen officially recognized as such, while the teacher number is for pedagogical academies and the 1930/1 total also includes art and music schools. Figures in parentheses, compiled by H. Titze, include students in primary teacher training seminaries in Prussia which achieved recognition as higher education only in 1925. The Russian figure is for institutes, i.e. higher technical training, with the 1860 number estimated according to the 10% of schools classified as higher and the 1920 and 1930 numbers estimated by subtracting university enrollment from total higher education enrollment. The United States figures are for one half of the college and university students as well as all of the students in normal schools and teacher's colleges, on the assumption that roughly half of the college/university curriculum was equivalent to non-university instruction (such as in engineering and nursing) in Europe and that normal schools and teacher's colleges were definitely part of the non-university sector in Europe.

Table 3: Relative Enrollment in Higher Education

country/ year	Britain R	Britain K	Britain L	Germany R	Germany K	Germany J	Russia A	United States R	United States K	United States B
1860/1			.30			.50	.14			3.1
1870/1			.40	.6		.63				2.3
1880/1			.58			.77	.17	1-2.0		3.4
1890/1		.41	.73	1.0	.67	.93		1.5-2.5	1.79	3.5
1900/1	1.2	.41	.79	1.2	.94	1.12	.20	1.5-3.5	2.29	5.0
1910/1	1.2	.58	1.31	1.5	1.26	1.63	.80	2.0-4.0	2.89	5.6
1920/1	2.7	1.60	1.96	2.7	1.97	2.47	1.20	2.5-5.0	4.66	9.0
1930/1	2.7	1.60	1.89	2.7	1.98	2.61	4.30	6.0-7.5	7.20	15.0
per five year age cohort:			1.89			2.61	4.30			11.25

Note: R=Ringer, K=Kaelble, L=Lowe, J=Jarausch, A=Alston, B=Burke. Ringer's British figures include all postsecondary education, while Kaelble's numbers are related to 20-to 24-year-olds. Lowe's more precise figures comprise universities, teacher training and technical education in colleges. Ringer's German figures include universities and technical colleges but exclude teacher training andare based on the 20-23 year cohort in contrast to Kaelble who uses the above sources but compares to 20- to 24-year olds. Jarausch employs rather the 19- to 23-year-olds and includes teacher training in his student numbers for the 1910s to 1930s. Alston's column, for which there are no comparable figures, rests on calculations of students compared to 20- or 24-year-olds. Ringer's U.S. figures register the range of college graduates. Kaelble's U.S. data are based on the same age span as before, clearly inappropriate for U.S. students. Burke's figures compare rather to 18- to 21year-olds (a shorter span) and are self-aggregated. His 1860 figure is only for males, while the 1870ff index is based both on males and females.

modern high schools (such as the *Realgymnasia* and *Oberrealschulen* in Germany after 1900), minorities (like the Jews in Russia after 1905) and foreigners access to higher learning which had previously been denied. (3) Moreover, this emergence of a "compensatory" sector of higher education of lower prestige and also lower prerequisites in applied technology (the Russian special institutes) and teacher education (the normal schools etc.) provided "soft" options unavailable before. (4) Similarly, the cooptation of new curricula into extant institutions (such as commercial training in Germany or home economics in the United States) made their offerings more attractive and vocationally relevant than the older prestige professions. (5) Finally, once begun, rapid expansion fed upon itself, since higher education, acting as lead sector, absorbed the majority of its own graduates to sustain the growth in secondary schools, universities and non-university institutions.[15]

Among the broader, indirect reasons, increasing demand appears to have been as important as rising supply. (1) Although often invoked, population growth seems at best to have been a necessary but not sufficient precondition, since it did not always translate directly into expansion of higher learning (as in the second half of the 18th century), unless first channeled through a secondary education system. (2) Despite occasional short-range negative correlations with the business cycle, economic growth seems to have been imperative as an underlying condition both as a consumption good (more affordable with the spread of prosperity) and as an increasingly necessary job prerequisite because of the academization of business and the standardization of careers. Though difficult to measure, rising demand for educated manpower (apparent as favorable career prospects for academic professions) exerted a powerful attraction for secondary school graduates. (3) The pull of social prestige operated somewhat more nebulously since many scholars presuppose a desire for upward mobility without explaining how it comes about. Higher education became a coveted avenue of social mobility when status was no longer ascribed (as in an estate society) but attained by individual effort (as in a liberal class system). (4) Although educational policies tried to foster economic growth, the state, in Russia and Germany suspicious of oversupply, often affected the labor market more by expanding the higher civil service. Only after World War One did conscious attempts to create equality of educational opportunity begin to have an impact on enrollments (as in Russia in the 1920s). (5) Finally, the reversal of cultural attitudes after the enlightenment in favor of neohumanism and scientific research seems to have translated only hesitantly into greater student numbers although it no doubt contributed in the long run to the vitality of the arts and sciences (in the U.S., Britain and Germany). A comparison of causes of enrollment expansion therefore does not suggest a tight model, but rather a diffuse set of internal and external factors, generally related to modernization, which need to be proven more explicitly.[16]

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15. R. A. Lowe, *The English School: Its Architecture and Organization* (Birmingham, 1977); H. Titze, *Die Politisierung der Erziehung. Untersuchungen über die soziale und die politische Funktion der Erziehung von der Aufklärung bis zum Hochkapitalismus* (Frankfurt, 1973); P. L. Alston, *Education and the State in Tsarist Russia* (Stanford, 1969); C. B. Burke, *American Collegiate Populations* (New York, 1982).
16. For a somewhat more ambitious approach see J. E. Craig and N. Spear, "The Dynamics of Educational Expansion: A Methodological and Conceptual Framework," paper presented

Often treated only in passing, the implications of the enrollment expansion for the emergence of the modern system were considerable. When it was allowed to operate unchecked (unlike in Russia where it was bureaucratically controlled to eliminate dissent), the dynamism of attendance resulted in liberal-capitalist market cycles of varying length. In each major field or faculty, growth would produce "an excess of educated men" in a career which would discourage students and eventually make numbers decline absolutely or relatively until the demand for graduates was restored, when the whole cycle (with some delay) would be set into motion again. For instance, in Germany this mechanism produced academic unemployment crises in the 1790s, 1830s, 1890s and 1920s. The consequences of expansion for institutional structure, social access and professional training, therefore, need further consideration. Not only in the U.S. did self-sustained system's growth create the first mass universities and a near chaos of hierarchically ranked, but competing, centers of higher learning. The persistence of inequality of educational opportunity which both helped and hindered the enrollment expansion also requires more debate. Whereas aspirations for mobility pulled many lower middle class youths into higher education during favorable prospects, oversupply crises discouraged lower class pupils from continuing their education while only deflecting privileged sons from one attractive career to another. Nevertheless the overall growth in student numbers eventually produced more graduate professionals which furthered the academization of government and business. Educational expansion should, therefore, not be taken for granted, since its pattern, causes and consequences pose a number of unresolved questions, such as the continued growth in liberal education in the U.S.[17]

The Diversification of Institutions:

A second major aspect of the transformation of higher learning is the process of institutional diversification. Around the turn of this century academic observers began to discuss the emergence of *Großwissenschaft* or of the *Großbetrieb der Wissenschaft* as scientific "counterpart to large scale industrial enterprise" and to big government.[18] In contrast to the small, intimate, semi-monastic institutions of earlier times, the large, impersonal scholarly factories were animated by a new spirit and developed novel complex structures. For instance, the universities of Berlin and Moscow enrolled about 10,000 students on the eve of the war. Although one dimension of this

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at the Comparative and International Education Society Conference (Vancouver, 1980); C. A. Anderson and M. J. Bowman, "Education and Economic Modernization in Perspective," in L. Stone, *Schooling and Society* (Baltimore, 1976), 3-19.

17. D. K. Müller, *Sozialstruktur und Schulsystem. Aspekte zum Strukturwandel des Schulwesens im 19. Jahrhundert* (Göttingen, 1977) and "Modellentwicklung zur Analyse von Krisenphasen im Verhältnis von Schulsystem und staatlichem Beschäftigungssystem," *Zeitschrift für Pädagogik*, 14. *Beiheft* (Weinheim, 1977), 37-77; U. Hermann and G. Friedrich, "Qualifikationskrise und Schulreform. Berechtigungswesen, Überfüllungdiskussion und Lehrerschwemme," *ibid.*, 13 (1977), 309-325.
18. T. Mommsen, "Antwort an Harnack, den 3. Juli, 1890," *Reden und Aufsätze* (Berlin, 1905), 209f; A. Wagner, *Die Entwicklung der Universität Berlin, 1810-1896* (Berlin, 1896); A. Harnack, "Vom Großbetrieb der Wissenschaft," *Preußische Jahrbücher*, 119 (1905), 193-201.

growing diversity is the proliferation of research disciplines investigated by J. Ben-David, the process is broader and more encompassing, since it also includes the emergence of new types of higher learning, which differ in prestige, and the establishment of new teaching specialties, which only sometimes coincide with fields of knowledge and include higher and lower training levels. A broader taxonomy suggested by B. R. Clark defines "differentiation" as occurring *among* institutions in horizontal (various sectors) or vertical (hierarchical) directions or as taking place *within* institutions along horizontal (scholarly sections) or vertical (tiers of training) lines. In this framework the central comparative questions become: How much differentiation did the expansion of institutional size produce in contrast to earlier decades? Along which of the four axes did the transformation diversify the character of higher learning most dynamically? Did differentiation operate unchecked or was there not also a countervailing tendency towards institutional convergence on the pure research model? Because national, cultural and administrative peculiarities render quantitative comparisons difficult, the discussion of differentiation remains somewhat impressionistic, although within individual countries it can and must be based on hard numerical evidence.[19]

Because "differentiation is then in part an accumulation of historical deposits," its elusive processes can be most easily identified on the external level between institutions. The fundamental mechanisms in all four countries appear to be the adding-on of new types, the upgrading of existing secondary institutions and the transformation of their function towards the traditional university ideal. Since cloning of universities themselves was relatively slow and their size could not be stretched indefinitely, the simplest response to growth pressures was the addition of new sectors such as the commercial colleges and administrative or pedagogical academies in Germany after the turn of the century (Table 4). Rarely, if ever, were they completely new, but rather built like the *Technische Hochschulen* on older secondary polytechnics, which were raised to tertiary rank in 1875, and after a protracted struggle received formal equality in 1900 so that they are today known as technical universities. However the price of legal and social recognition was often the adoption of the traditional university ethos or governance and the transformation of the curriculum towards pure rather than applied research and towards the humanities. Some institutions, like the British redbricks, altered their entire mission from higher technical training towards the traditional university function. This horizontal differentiation was accompanied by vertical diversification as well, since relatively homogenous systems developed an elaborate set of formal and informal hierarchies. Even after the achievement of legal parity, the older core universities such as Oxbridge continued to overshadow the new civic universities, who in turn lorded it over the teacher's colleges and technical colleges. Only in Russia did the technological institutes triumph completely over university *nauka*. But everywhere the applied institutions of higher learning began to threaten the numerical predominance of their elder scientific sisters. In the United States this vertical differentiation led to the establishment of recognized successive

19. J. Ben-David, *The Scientist's Role in Society: A Comparative Study* (Engelwood Cliffs, 1971); B. R. Clark, "Academic Differentiation in National Systems of Higher Education," *Comparative Education Review*, 22 (1978), 242-258; introductory comments by J. Herbst on diversification at the "Education and Social Change" conference, March 1980.

Table 4: The Non-University Share of Higher Education

	England	Germany	Russia	United States
1860	38.6	15.2		32.4
1870	31.2	23.0		48.4
1880	22.1	18.5	20.0	58.0
1890	16.3	18.7		54.0
1900	28.0	29.3	26.0	53.8
1910	36.6	21.8	36.0	59.2
1920	44.1	31.9	24.0	60.9
1930	43.7	27.6	73.0	58.3

Note: These percentages for non-university enrollments were calculated for Britain and Germany by dividing the figures in Table 2 by those in Table 1. The Russian figures are taken from Table 3 of J. McClelland, "Diversification in Russian-Soviet Education." Although there is no clearly definable university sector in America, the non-university share for the U.S. was estimated by taking one half of the college and university enrollment together with the normal school and teachers college figures from C. B. Burke. The high point of university dominance in each country is indicated by a ____, whereas the zenith of non-university enrollment is marked by a ....

tiers of higher education, with high school diplomas becoming a college entrance requirement and undergraduate preparing for professional and graduate study.[20] By the first third of the present century the institutional matrix had diversified to an extent that, except for Germany, higher education was hardly any longer synonymous with the university.

Since the internal differentiation within institutions of higher learning is less clearly understood, it might help to conceptualize developments as suggested by the German evidence.[21]. First, the personnel structure of universities appears to have

20. Clark, "Academic Differentiation," 250ff; S. Rothblatt, *The Revolution of the Dons: Cambridge and Society in Victorian England* (New York, 1968); P. Lundgreen, *Techniker in Preußen während der frühen Industrialisierung. Ausbildung und Berufsfeld einer entstehenden sozialen Gruppe* (Berlin, 1975); J. A. McClelland, *Autocrats and Academics: Education, Culture and Society in Tsarist Russia* (Chicago, 1979); J. A. McLachlan, "The American College in the Nineteenth Century: Toward a Reappraisal," *Teacher's College Record*, 80 (1978), 287-306.

21. R. Riese, *Die Hochschule auf dem Wege zum wissenschaftlichen Großbetrieb*, 94ff; K. D. Bock, *Strukturgeschichte der Assistentur. Personalgefüge, Wert- und Zielvorstellungen in der deutschen Universität des 19. und 20. Jahrhunderts* (Düsseldorf, 1972); R. Rürup, ed., *Wissenschaft und Gesellschaft: Beiträge zur Geschichte der Technischen Universität Berlin* (Berlin, 1979).

shifted from full professors (over half in Berlin 1810) towards assistant professors (51% by 1909). Senior scholars had less and less student contact (the ratio deteriorated from 21 to 64 students per professor) so that three quarters of all courses were taught by untenured faculty. Below them a whole new category of *Assistenten* (research and teaching assistants, often with a Ph.D.) emerged to staff proseminars and laboratories, whose labor was often exploited and who were denied participation in academic self-government. Second, the number of teaching fields and subfields continued to multiply, since the same course was not simply subdivided into sections, but rather new variants of basic lectures were developed together with novel subspecialities (which sometimes proved ephemeral). While the total number of offerings tripled in Berlin from 571 in 1860 to 1677 in 1909, modern history, which had been taught by the legendary L. von Ranke in 1871, fragmented into five courses (by Sternfeld, Breysig, Schmitt, Schiemann and Hintze) in 1914, a specialization which was even more thorough in the technical subjects. Not only did earlier innovations spread through the entire national system, but the center of instruction shifted from lectures to seminars (their ratio changed 6.1 to 1 towards 2.9 to 1 at Berlin). Third, in research, the seminar and the institute proliferated as the focus of activity, especially in the humanities, sciences, medicine and even more so in technology. In Heidelberg the three original seminars were joined by 23 others before World War One and the natural science institutes doubled in number and expanded in size so that research shifted out of the individual scholarly study or home laboratory into a large, well financed facility. Although this proliferation of junior faculty, teaching specialities and research disciplines continued the impetus of the early 19th century, its intensification and spread to lesser institutions created the modern diversified university.

Only a tentative list of factors commonly advanced as explanations can be offered at this point. (1) While the explosion of student numbers in some areas justified diversification (like in the humanities), it failed to produce this effect in others (such as law, which handled them with only a few faculty members). (2) Although the professional research imperative created numerous subfields within established disciplines such as medicine, it had apparently somewhat less effect on the natural sciences and can therefore not simply be used as general cause without further qualification. (3) Undoubtedly the academic labor market influenced the differential rates of diversification of faculties or institutions, but demand for graduates was often fickle and unpredictable. While established professions (such as medical doctors) could manipulate it, "scientification" was less successful in the natural sciences where professionals (industrial chemists) were weaker. (4) Donors and philanthropists, as in the celebrated case of the Cavendish laboratory, facilitated the establishment of new institutions (University of Chicago, Stanford) or institutes. But their impact was heaviest in capital intensive fields (such as technology) and in countries with private higher education (such as in the United States and Russia). (5) Similarly academic, professional, business or political groups might speed the foundation of a new chair or the granting of parity for the technical colleges (like the German VdI, association of engineers), but as often as not they failed to convince the public and the government to grant university admission as to the Prussian primary schools teachers (DLV). (6) Obviously government policy, whether as general willingness to fund (as Prussia under Friedrich Althoff) or in specific targeting of growth (as Russia in the non-subversive institutes) played an enormous role. But students were not always willing to follow so

that some heavily supported sectors like engineering and agriculture in the U.S. differentiated professionally without adequate audience among academic youth. (7) Finally, the structure of the scientific community seems to have been important in slowing down fragmentation in older, more theoretical disciplines and allowing greater latitude in newer, largely applied fields of uncertain cognitive boundaries. These ambiguities and ironies indicate that causes of differentiation should be less confidently postulated than cautiously documented in each particular instance.[22]

The dynamics of diversification also had some important consequences. Internal institutional differentiation furthered the emergence of the academic career as a sequential profession with restricted room at the top, which on the continent created the *Ordinarienuniversität,* controlled and run for the chairholders. Moreover disciplinary specialization led to the loss of philosophical unity and the increasing erosion of "liberal education" in favor of research training or professional preparation. At the same time the traditional fusion of *Forschung und Lehre* began to break down, since the gap between teaching and research widened to such an extent that much scientific innovation was carried on in semi-autonomous institutes, supported by foundations like the Kaiser Wilhelm Gesellschaft. External differentiation between institutions began to threaten the autonomy of higher education, since the necessary increase of state funding allowed the educational bureaucracy to exert greater policy control even in those countries like England and the U.S. where formal governmental interference was minimal. Moreover, the establishment of scientific institutes and more so independent technological institutions linked higher learning more closely to the mature industrial economy. In some sectors, like electronics, chemicals or machine building, industry began to rely not only on basic but also applied research at the *Technische Hochschulen* or Russian institutes. Finally the emergence of competing centers of higher learning with somewhat different educational missions created a status hierarchy of institutional types, which offered compensatory social access but also condemned the more "modern" sectors to continuing inferiority unless they conformed to the older neo-classical mold. As a counterpoint these centrifugal forces created centripetal trends like informal research networks, formal scholarly associations (American Historical Association) and regional accrediting associations (North Central) which unified specialities, disciplines and institutions in an academic community. Ironically the dialectical result of this double differentiation was therefore a growing convergence on the new type of a modernized, diversified higher education conglomerate.[23]

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22. The generational element, mentioned by Sheldon Rothblatt, also comes into play, but in itself is rarely enough to explain the process, since age tension may lead to conformity as well as to innovation. Cf. A. Spitzer, "The Historical Problem of Generations," *American Historical Review*, 78 (1973), 1353–85.
23. S. Rothblatt, *Tradition and Change in English Liberal Education* (London, 1976); F. Pfetsch, *Zur Entwicklung der Wissenschaftspolitik in Deutschland* (Berlin, 1974); R. R. Locke, "The End of Practical Man: Higher Education and the Institutionalization of Entrepreneurial Performance in France, Germany and Great Britain, 1880–1940" (MS Hawaii, 1981); J. A. McClelland, "The Mystique of *Nauka*: Science and Scholarship in the Service of the People," appearing in a volume edited by T. G. Stavrou (1981).

Another important dimension of the transformation of higher learning was the broadening of social recruitment of students and, thereby ultimately, also of professors. While turn-of-the-century apologists of the university claimed that "the possessors of academic culture ... come from all classes of society", critics charged that "higher education is a right, reserved for the rich, but inaccessible for the great mass of the people". Statistically documenting the existence of such inequality, some well-known social scientists as R. Dahrendorf, P. Bourdieu and Ch. Jencks have debated the reasons for discrimination and argued vigorously for compensatory policies, favoring working class children, religious minorities, rural youths, women and blacks.[24] Since in the 19th century the liberal principle of equality of opportunity became generally accepted, the discussion largely revolves around evaluative perspectives of time and place. Viewed against the backdrop of earlier elitism, almost any broadening of access seems progressive; seen in terms of more recent egalitarian advances, earlier openings appear insignificant. Part of the difficulty also lies in the problem of measuring the relative "social openness" of higher learning in contrast to other time periods and countries. While published government figures are often designed to cover up important analytical distinctions, social classification schemes are largely incompatible, especially when applied across boundaries or temporal eras. In order to compare at all the historian is forced to run the double risk of employing categories whose internal meaning changes over time and varies in different countries, consoling himself with the notion of functional equivalence. Fortunately the procedures of measurement, such as indices of representation, are less controversial and can be refined by focusing on the youth-population at risk.[25] Therefore questions about the recruitment of higher education abound: Did educational opportunities increase or decrease with industrialization? What were the national or continental patterns of access? What were the causes and consequences of the partial social opening?

The fragmentary comparative evidence from 1860 to 1930 suggests that the social recruitment of higher learning altered significantly in all four countries (Table 5).[26]

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24. F. Paulsen, *The German Universities: Their Character and Historical Development* (New York, 1895), 110ff; the Socialist deputies Strobel and Liebknecht in the Prussian Landtag on April 25, 27 and June 13, 1910, *Stenographische Berichte des Abgeordnetenhauses*, vol. 544; R. Dahrendorf, *Society and Democracy in Germany* (Garden City, 1967); P. Bourdieu and J. C. Passeron, *Les Heritiers. Les étudiants et la culture* (Paris, 1966); Ch. Jencks, *Inequality: A Reassessment of the Effect of Family and Schooling in America* (New York, 1972).
25. Ringer, *Education and Society*, 22ff; H. Kaelble, "Educational Opportunities and Government Policies," *passim;* R. Boudon, *Education, Opportunity and Social Inequality* (New York, 1975); C. A. Anderson, "The Social Status of University Students in Relation to the Type of Economy," *Transactions of the Third World Congress of Sociology*, 5 (1956), 51-63.
26. For the sources of Table 5 see L. Stone, "The Size and Composition of the Oxford Student Body," 103; J. Floud, "The Educational Experience of the Adult Population in England," in: D. Glass, ed., *Social Mobility in Britain* (London, 1954), 137f; K. H. Jarausch, "The Social Transformation of the University," 625; H. Kaelble, *Historische Mobilitätsforschung*, 102; A. Rashin, "Gramatnost' i narodnoe obresovanie v Rossii," *Istoricheskie zapiski*, 37 (1951), 78; V. R. Leikina-Svirskaia, *Intelligentsiia v Rossii* (Moscow, 1971), 62-4; J. McClel-

Table 5: The Social Origin of Students in Percent

	1870				1890				1910				1930			
	Brit.	Germ.	Russ.	U.S.	Brit.	Germ.	Russ.	U.S.	Brit.	Germ.	Russ.	U.S.	Brit.	Germ.	Russ.	U.S.
upper class	40	?	60	9.7	21	?	23	8.5	15	?	8	3.8				
upper middle																
profess:	49	41.7	17	27.5	54	31.1	43	22.1	48	22	29.3	20.1	47.0	22	11.9	18.9
busines:	7	22.9	4		19	38.0	9		21	17	10.3			13		24.2
lower middle																
old:	2	35.1	5	7.3	6	30.0	11	3.1	7	28	24.3	3.4	30.1	18	49.2	24.7
new	0			12.8	2			12.5	2	27		15.9	17.6	37		22.9
lower class:	0	.3	3	12.8	0	.1	3	5.1	1	3	14.5	8.9	5.1	4	20.2 18.2	6.8
unknown	2			29.8	1			49.5	5	2	4	47.7		6		

Note: The classification scheme is based on Jarausch, "Occupation and Social Structure in Modern Central Europe," Historical Social Research, 11 (1979), 10-19. The "upper class" includes the nobility, the landed gentry and the urban patriciate. The "upper middle class" is divided into professionals (with higher learning) and businessmen (entrepreneurs, bankers, etc.). The "lower middle class" distinguishes the older (artisan, shopkeeper, peasant) from the newer (white collar employee, teacher, government official) elements. The "lower class" is a catchall for the proletariat and the lower layers of society. Since it generally received some form of higher education, the clergy was grouped with the academic professions (even in England and Russia where it is usually listed separately). On the assumption that peasants' sons were not from the landless laborer families but from prosperous households, farmers' children appear under "old middle class," except for Russia where they were the estate from which sprang the industrial proletariat, separated out in the 1930 figure. The British figures for 1870 to 1910 are based on Oxford and the 1930 numbers on a random sample of British adults born before that year. The German figures for 1870 and 1890 are based on Berlin, Leipzig, Wurttemberg and Bonn and the 1910 and 1930 numbers pertain to the country as a whole. The Russian 1870 (1865), 1890 (1880) and 1910 (1914) figures include all universities, while the 1930 (1927/8) number refers to all of higher education. The U.S. figures between 1870 and 1910 (1873-1898) are based on the University of Pennsylvania, while the 1930 (1925) number includes a sample of 55 colleges and universities.

Although partly a definitional artifact (landed elites are no longer identifiable in the 20th century), the nobility and the traditional agrarian upper class all but disappeared from higher education, both relatively and somewhat less so absolutely. Similarly the educated professionals, half of which had, in the middle of the 19th century, recruited themselves, declined in importance to about 1/5 of the student body. Their place was taken in the 1890s by the new commercial and entrepreneurial elite (with between 1/5 and 2/5 of all students) as logical alternative stratum with sufficient means to afford post-secondary training. After the turn of the century, the entire upper middle class was outstripped by students from lower-middle-class homes, who, with the spread of prosperity, began to supply about half of the students. Although in the mid-19th century the traditional callings of artisan, shopkeeper and peasant had made up the bulk of petit bourgeois representation, by the 1930s the newer service pursuits such as white collar employees, middling and lower officials, schoolteachers, etc. overshadowed them (in Germany by 2-to-1). Initially almost totally excluded, the working class breached the educational barrier after the First World War, especially in Russia, but also to some extent in Britain and in non-elite U.S. institutions like Temple. While the German pattern reveals this sequence first, the English figures follow it (especially when one assumes a less elitist cast for the redbricks) and exceed it in terms of working class access by 1930. In the Russian case an educated middle class first had to be created out of the nobility before the lower middle class could emerge as the strongest parent stratum, and the astounding 38.4 lower class proportion in 1927/28 is a result of the conscious proletarianization policy of the Bolsheviks. While the Penn figures for the U.S. demonstrate both the breakthrough of "ordinary" sons after 1890 and the tenacity of the elite after 1910, the multi-college 1925 sample shows a preponderance of business (50%) over professional or service (ca. 42%) clientele and a respectable but restricted working class representation. Finally, institutional differentiation also produced a remarkable pattern of access differences. Within universities some units (such as catholic theology) tended to be more accessible than others (such as law); some tiers, such as undergraduate instruction, were more open than others, such as professional schools (medical). Among institutions the applied (vocational) training centers were likely to be more lower middle class than the theoretical research combines, thereby creating a prestige hierarchy which was justified by claimed functional differences. But despite variations over time, nationality and institution, the basic thrust of expansion and differentiation led to the emergence of the middle class university.[27]

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land, "Proletarianizing the Student Body: The Soviet Experience," *Past and Present*, 80 (1978), 134–5; R. Angelo, "The Students at the University of Pennsylvania and the Temple College of Philadelphia," *History of Education Quarterly*, 19 (1979), 186; E. O. Reynolds, *The Social and Economic Status of Students* (New York, 1927).

27. H. Perkin, *Key Profession: The History of the Association of University Teachers* (London, 1969) and *The Origins of Modern English Society* (London, 1969); J. E. Craig, *Scholarship and Nation-Building: The Universities of Strasbourg and Alsatian Society, 1870–1914* (Chicago, 1983); D. R. Brower, *Training the Nihilists: Education and Radicalism in Tsarist Russia* (Ithaca, 1975); R. Angelo, "The Students at the University of Pennsylvania," 179–205. Cf. also B. R. Clark, "Problems of Access in the Context of Academic Structures," *Yale Higher Education Working Paper*, 16 (New Haven, 1977).

The causes of the broadening of access to higher learning are as vigorously disputed as its extent. (1) The economic discussion revolves largely around the emergence of a mature industrial economy which augments certain strata (like plutocratic entrepreneurs) and diminishes others (like the landed gentry and, because of agricultural rents in Britain, also the clergy). Moreover it involves the spread of prosperity which made education available as a consumption good to larger groups. Similarly, it focuses on the growth of science based and technological industries like electronics and chemicals, which created a demand for trained manpower such as engineers, chemists and the like. Finally, it also touches on the rise of big business which required a new layer of salaried and college educated employees to administer its far-flung concerns. (2) While conceding the significance of academic self-recruitment, the social debate emphasizes on the one hand popular aspirations for mobility, especially for those members of the new middle class who were emulating their workplace superiors. On the other hand it stresses the importance of the preservation of status through educational means, starting with the nobility and its endangered birth prerogatives and descending through the plutocracy (for younger sons who could not inherit) to the old middle class which tried to transform its meager possessions into educational certificates. (3) The political argumentation centers on state policy towards certain strata (like the Russian nobility in the 1850s or the proletariat in the 1920s) since admissions favored particular groups or discriminated against others (antisemitic quotas for instance). However it also underscores the expansion of government bureaucracy in the direction of the welfare state which created an intermittent but generally growing demand for graduates as in Germany. (4) Taking for granted the attractiveness of the ideal of the educated man, cultural explanations address the astounding popular hunger for self-improvement which often transcendend any functional justification. While the effects of secularization on the cultural elite have been widely discussed, the importance of the deauthorization of religion for the middle and lower classes and the emergence of a pro-educational scientism need to be probed further.[28] Incorporating many aspects of the general transformation of society, these causative factors nevertheless found very real limits in resources, aspirations, institutional policies and cultural styles which preserved the continued exclusivity of much higher learning.

What were the consequences of the emergence of the middle class university? During mature industrial society the traditional elite system, mitigated by charity and patronage, gave way to a modern, competitive pattern, characterized by the struggle of previously uninterested (such as the wealthy middle class) or excluded (such as the new middle class) strata for access to higher learning. A comparison of the fragmentary indices of recruitment (Table 6)[29] indicates a gradual decline of the over-repre-

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28. H. Kaelble, "Educational Opportunities in Europe, 1900–1970: The Emergence of a Pattern?" (paper delivered at the "Education and Social Change" conference, 1980); P. Lundgreen, "Besitz und Bildung. Einheit und Inkongruenz in der europäischen Sozialgeschichte?" *Geschichte und Gesellschaft*, 7 (1981), 262–75; J. McClelland, "Proletarianizing the Student Body," 122–146. Cf. Ringer, *Education and Society*, 71 ff, 157 ff.
29. The Cambridge and Oxford figures are from Kaelble, "Educational Opportunities," Tables 4 and 5 with a lower class figure added for Oxford on the assumption that about 50% of the British population in 1910 fell into that category. The pre-1930 sample is recalculated from

Table 6: Social Access to Higher Education: Index of Recruitment and Dissimilarity

	England			Germany			Russia			United States
	Cambri. 1850-99	Oxford 1910	sample bef.1930	Heid&Kiel 1847-57	Prussia 1911/2	Germany 1930	all higher ed. 1914	students 1923/4	1927/8	55 college sample 1925
elite				35.3			21.6			
profs.				79.2		3.7	25.0			3.5
up. mid.	57.0	48.0	6.6		7.0					
busin.				5.8		1.4	12.8			3.0
	2.2	6.4			2.0			5.6	6.3	
old mc.						0.9				0.9
lowerm.			1.5	0.6			2.6			
new mc.					2.2	2.5				1.2
lower	0.0	0.02	0.3	0.006	0.03	0.08	0.2	0.32	0.42	0.12
dissim.			22	5883		46	108		15	21

Note: The Index of Recruitment is calculated by dividing the percentage of students from a certain stratum by the percentage of professionals in the population. Hence values above 1 indicate over-representation and values below 1 under-representation. The Index of Dissimilarity is calculated by dividing the index of representation for the highest by that of the lowest stratum in the table. As values decrease toward 1, the disparity of representation of different social groups diminishes. In order to minimize distortions due to the difficulty of matching social categories for students and the population, combined figures have been presented wherever separation proved analytically impossible.

sentation of the elite and upper middle class and therefore a reduction in the disparity between upper and lower classes, as well as a gradual convergence towards a common distribution.[30] But the gains were not duplicated to the same degree by working-class children, farmers' sons, the offspring of minorities, etc. They began to make considerable progress in Russia and Britain, but still remained substantially under-represented everywhere. Moreover much of the new equality was rhetorical rather than real, compensatory more than substantive, since cooptation into the outer layers of learning, the applied institutions, technological subject areas, or open faculties like theology and philosophy, permitted the perpetuation of elitism in the more prestigious professions such as law and medicine. By raising expectations while only partially fulfilling them, this limited opening of higher education increased social tensions within institutions. It also created political pressures which prompted the first measures to reduce inequality and eventually led to a new era of welfare opportunities in the middle of the 20th century. Ironically the influx from the lower middle class and the limited inclusion of the working class helped to stabilize the system. When the children of these educationally mobile children entered the university, they contributed to "academic" self-recruitment, keeping its share at about 1/5 of the student body from then on. Finally the partial broadening of recruitment also furthered the importance of educational qualifications over job performance in government and business. Hence the middle-class complexion of the university served to legitimate its increasingly important selection function by blending cultured self-perpetuation and status preservation with a degree of mobility based on meritocracy.[31]

The Process of Professionalization:

The newest focus of the debate about the transformation of higher learning is the emergence of the professions. Rescuing the "forgotten middle class," i.e. the non-

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J. Floud, "The Educational Experience," 137f. The Heidelberg and Kiel figures are from Jarausch, "Die neuhumanistische Universität und die bürgerliche Gesellschaft," *Darstellungen und Quellen zur Geschichte der deutschen Einheitsbewegung,* Table 9; The German figures for 1930 are recalculated from Kaelble, *Historische Mobilitätsforschung,* Table 12 and Ringer, *Education and Society,* 315. The Russian 1914 figures are from D. Brower, "Social Stratification," Table 2; the Soviet figures for 1923/4 and 1927/8 are from J. McClelland, "Proletarianizing the Student Body," Table 4. The U.S. 1925 sample is calculated once again from Reynolds, *Social and Economic Status.*

30. Some national pecularities in Table 5 deserve notice. Although virtually non-existent in Oxbridge in the middle of the 19th century, the working-class had made considerable gains in England by the 1930s. In Germany the opening was a victory of the new middle class (2.5 times over-represented) which means that Central Europe was most elitist by 1930, although it had started out more openly. In Russia the change was most rapid and complete, so that the proletariat was over-represented (1.6) by the late 1920s. In America business representation was particularly strong and the service occupations also exceeded the old middle class, whereas the system appears more accessible for workers in individual institutions such as Temple than as a whole.

31. The concepts of charity, competitive and welfare opportunities are from H. Kaelble, "Educational Opportunities and Government Policies," part one; Cf. Jarausch, "The Social Transformation of the University," 60ff, and "Die neuhumanistische Universität," *passim.*

capitalist bourgeoisie, from oblivion, this concept draws attention to the social product of higher education, the academics, and to their impact upon society. Since contemporaries talked about *Berufsstand* (occupational estate), in Central and Eastern Europe the very term was a Western import, although its implications were very much in evidence. If one accepts B. Bledstein's definition as a basis for discussion ("a full time occupation in which a person earned the principal source of an income ... mastered an esoteric but useful body of systematic knowledge, completed theoretical training before entering a practice or apprenticeship, and received a degree or license from a recognized institution"), the crucial role of higher learning for the emergence of "the culture of professionalism" is obvious. Because of the slipperiness of the concept, which is embroiled in an interminable discussion about a finite set of ideal-typical traits, this analysis must be limited to its connection with higher education, whose importance can hardly be overestimated for professionalization. In order to reduce the confusion, three preliminary clarifications are in order. (1) Although the development of the professorial research ethic is central to the rise of the academic profession, the professionalization of the callings of university graduates is distinctive, broader and sometimes independent of higher learning. (2) Both processes within and without the university take place in an interactive triangle composed of the profession (with its practitioners and organizations), the state (as regulator and certifier) and institutionalized higher education (as training ground). (3) While expansion, differentiation and recruitment condition their interplay, higher learning affects professionalization primarily in terms of admission (selection), curriculum (knowledge) and examination (credentialling).[32]

The relationship between professionalization and higher learning is, therefore, more complex than assumed in static sociological theory or historical analysis, proclaiming it a dominant principle of contemporary society. Although "professional" training had, in the Middle Ages, taken place in the universities, by the middle of the 19th century liberal education and pure research had pushed much professional preparation outside, e.g. in England. Only in the present century was it gradually reabsorbed by higher learning. Moreover the "old professions", usually defined as the clergy, lawyers, doctors (that is problematic especially in the U.S.) and professors, already flourished by 1850 and therefore only expanded in size, increased in scientific character, and somewhat opened their recruitment thereafter. The emerging "new professions", such as high-school teachers, engineers, chemists, etc. were more intimately involved, since their victories in gaining university admission, in obtaining scientific standing for their disciplines and in achieving a standardized and recognized set of examinations were both cause and consequence of enrollment expansion, differentiation and social opening. At times the resistance of the state bureaucracy and of university professors to organizational pressures could defeat the aspi-

32. B. J. Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York, 1976), 86f; A. LaVopa, "The Language of Profession: Germany in the Late 18th Century" (MS, Princeton, 1980); D. Rüschemeyer, "Professionalisierung: Theoretische Probleme für die vergleichende Geschichtsforschung," *Geschichte und Gesellschaft*, 6 (1980), 311-325; K. H. Jarausch, "Higher Education and Professionalization" (comment on a session on "Careers, Profession and Nineteenth Century Higher Education" at the 1979 SSHA meeting at Cambridge).

ration of an upwardly mobile occupation which carefully imitated the model of the older professions. At other times they were deflected into less prestigious units, tiers or types of institutions, even if they occassionally shared the same function as in Tsarist Russia. Finally, the interaction between higher learning and professionalization also varied by social/cultural tradition. The liberal Anglo-American model was characterized by vigorous professional organization and autonomy (even in professional training). In contrast the bureaucratic German–Russian pattern depended heavily on state regulation and licensing, since all three corners of the triangle (professionals, officials and professors) revolved around government.[33]

Although some university spokesmen claimed to pursue only science (*Wissenschaft, nauka*), higher education, by also providing professional training, influenced professionalization in three fundamental ways. First, formal admission requirements and informal pressures of habit and expectation combined to create a clearly indentifiable pattern of social selection among fields of study and institutions, which channeled certain social strata into specific professions. Everywhere law was the most prestigious faculty, attracting the nobility or the wealthy patriciate as well as some children of academics. Medicine was somewhat more diverse with doctors' or apothecaries' offspring, wealthy sons and some lower-middle-class children able to afford its considerable costs. Favored by sons of clergymen, Protestant and Orthodox theology drew upon teachers' and peasants' children because of its numerous stipends, while Catholic theology was even more lower middle and lower class. Finally, the arts and science subjects were the true melting pot of the university, blending a few academic children with sons of the plutocracy and especially of the old and new lower middle class. The less prestigious institutes, specialized schools, etc., aside from their practitioners' children, attracted an even less distinguished clientele except for some special Russian institutes and high technology institutions. Second, the curriculum provided an aura of scientific theory, so important to the professional's claim to superior expertise. However in practice the gulf between professorial research interests, the students' learning of the "scientific method" and the later needs of the practitioner seemed to be widening, except in industrial research. Hence the universities were less successful than the technical colleges and institutes in imparting practical skills which might be applied upon graduation without subsequent internship. Though less directly identifiable, liberal education also added an important command of culture and that social veneer which made the graduate acceptable as a member of the professional class. Third, the examination system, whether entirely academic (as for German chemists), bureaucratic (as for Russian doctors) or independent (such as the English bar examination), provided that essential proof of competence upon which the professional based his claim to market monopoly. The clash between the academic's insistence on intellectual attainment and the practitioner's

33. M. S. Larson, *The Rise of Professionalism: A Sociological Analysis* (Berkeley, 1977); H. Perkin, "Professionalization and English Society Since 1880" (MS Princeton, 1979); R. Spree, "The Impact of the Professionalization of Physicians on Social Change in Germany During the Late 19th and Early 20th Centuries," *Historical Social Research*, 15 (1980), 24–39; A. LaVopa, *Prussian Schoolteachers: Profession and Office, 1763–1848* (Chapel Hill, 1980); A. Engel, "Emerging Concepts of the Academic Profession at Oxford 1800–1845," in L. Stone, *The University in Society*, 1: 322–338.

emphasis on applicable skill, either divided the internal content of the examination as in the West or established two successive theoretical and practical stages as on the Continent.[34]

Since the numerical parameters of professionalization are somewhat indistinct, there is little agreement on the reasons for the interaction between profession and higher education. Focused on "the provision of an esoteric, evanescent, fiduciary service" Western literature generally argues that " the professions were called forth by the free market." Hence the collective manipulation of demand by organized practitioners who persuaded the public to grant them a monopoly in exchange for certain standards of expertise and skill became the central cause. However this liberal reconciliation of free competition with economic security was predicated upon the victory of the academically trained occupational elite over other practitioners, and therefore involved higher learning at least as an important political tool. In contrast, continental scholarship stresses "the close association of many professions with the authority and prestige of the state" which was the chief employer of older professionals, controlled educational requirements or testing procedures and regulated the practice of the liberal professions. The ascendancy of the old professions like doctors over non-academic competitors like surgeons, midwives, witches, etc. (in 1852 in Germany) may well have been a matter of the status policy of university graduates who persuaded the government to disenfranchise the others even before medical science had a higher cure rate than traditional folk healing. But once again the crucial argument that convinced the bureaucracy rested on the higher learning of the true professional. Because it was often used to gain power (such as by one professional faction over another), studies of professionalization ought to probe the educational dimension more thoroughly than hitherto. The coincidence between the rise of the new professions and the transformation of higher learning is not entirely accidental. Universities and especially technical colleges produced novel careers through scholarly specialization while aspiring practitioners time and again tried to legitimate their claim to professional status through higher learning. Ultimately professionalization and academization therefore fed on each other by continually upgrading entrance requirements (i.e. demanding more formal secondary schooling), making the curriculum content and teaching style more scientific (even trying to transform legal instruction from memorizing rules into legal research) and by increasing academic demands for the various certifying examinations.[35]

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34. A. Engel, *From Clergyman to Don: The Rise of the Academic Profession in 19th Century Oxford* (New York, 1982); C. E. McClelland, *State, Society and University in Germany 1700–1914* (Cambridge, 1980); C. E. Timberlake, *Essays on Russian Liberalism* (Columbia, 1972); D. Light, "Introduction: The Structure of the Academic Professions," *Sociology of Education*, 47 (1974), 2–28. Cf. K. H. Jarausch, "Professional Education at German Universities," (paper delivered at the Western Association for German Studies meeting at Wichita State University, 1980).

35. H. Perkin, "Professionalization," *passim;* Nancy M. Frieden, *The Russian Physician, 1830–1905: Professional, Reformer, Radical* (Princeton, 1981), especially chapter 5; C. Huerkamp, "Ärzte und Professionalisierung in Deutschland: Überlegungen zum Wandel des Arztberufs im 19. Jahrhundert," *Geschichte und Gesellschaft*, 6 (1980), 349–382; D. Rüschemeyer, *Lawyers and their Society* (Cambridge, Mass., 1973).

The implications of professionalization therefore involve not only higher learning, but also society and polity. Although the process began during the first half of the 19th century, in the subsequent decades the academic career emerged as full-fledged profession in its own right, structured into successive steps from *Assistentur* to *Ordinariat,* from tutorship to professorship. This process was accompanied by an increasing tension between professional training and liberal education. Expansion, diversification and social opening brought growing masses of vocational students into academe, but not only in Britain was the hold of neohumanism so strong that any number of technical colleges reverted to the arts curriculum and the collegiate model. Although in Russia technical training clearly won out by the 1920s, elsewhere the liberal arts (especially in the U.S.) showed a surprising resilience and popularity with students. Hence it would be incorrect to assert that professional training had triumphed completely. The very sequence of undergraduate study followed by a professional school, which emerged during this period, represents a compromise between both demands. In a broader sense, the professionalization of academe also led to a professionalization of society, since, however they were defined, the "professions" multiplied more quickly than the population at large (Table 7).[36] The older professions academized, organized and grew moderately, thereby gaining and maintaining an upper-middle-class position by combining a market monopoly with meritocratic educational credentials. The new professions strove mightily to follow this pattern through admission to some form of higher learning, recognition of the scientific nature of their expertise and establishment of certifying examinations based on knowledge and skill. However many aspiring groups remained quasi-professions, because their subjects were not academically recognized, their low pay consigned them to the lower middle class, and their associations were too weak to wrest autonomy from the public or the state. In creating professional status politics, professionalization contributed both to the spread of Liberalism in Central and Eastern Europe and to its internal division between a commercial-entrepreneurial bourgeoisie and a cultural-academic *Bildungsbürgertum.*[37]

Higher Education and "Modernization":

The emergence of the large, diverse, middle-class and professional system of higher learning between 1850 and 1930 casts a new light on the relationship between educa-

36. For the sources of Table 7 see B. R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), 60f. The first set of German figures (1852 and 1907) is from Jarausch, *Students, Society,* Table 2-3 as well as from T. Geiger, *Die soziale Schichtung des deutschen Volkes* (Stuttgart, 1932), 20ff. (for 1925). The other numbers are from W. G. Hoffmann, *Das Wachstum der deutschen Wirtschaft,* 204ff.

37. D. R. Skopp, "Auf der untersten Sprosse: Der Volksschullehrer als 'Semi-Professional' im Deutschland des 19. Jahrhunderts," *Geschichte und Gesellschaft,* 6 (1980), 383-402; R. S. Turner, "Social Mobility and the Traditional Professions in Prussia, 1770-1848" (MS, New Brunswick, 1979); P. Stearns, "The Middle Class: Towards a Precise Definition," *Comparative Studies in Society and History,* 21 (1979), 377-396. The non-economic sector of the upper and middle class has been consistently ignored by social historians preoccupied with industrialization.

Table 7: The Professions in the Workforce in Percent

	Britain		Germany		Russia	United States	
	Prof & Serv.	Prof & Tech.	Acad. Profs.	Prof & Serv.		Grads	Prof & Serv.
1852			0.64	2.9		.69	
1871	3.9			3.0		.84	1.78
1890	4.4			3.5		.92	3.96
1910	4.1		1.16	4.6	.19		5.4
1930	6.1		2.56	7.9	.31		8.0

Note: The categorization of the British census figures changed during World War One from "professional occupations and their subordinate services" to "professional and technical occupations." The last entry is for 1951. The first German figures attempt to include only presumptive graduates of higher education. In contrast the second German figures, according to census practice, include government officials and free professionals (except for the military) irrespective of academic qualification. The first Russian figure is from the 1897 census which indicates that 133,600 received some kind of higher education out of a workforce of 69,148,022 males and females. The second figure from the 1926 census (when it was dangerous to be regarded as a professional) is 233,000 (while another one of 280,000 also appears). Both were averaged to about 250,000 and compared to a workforce of 80,453,000 (including all 15-60 year olds). The figures were compiled by P. Alston. The first U.S. figures represent college graduates as proportion of all males over the age of 20. They were compiled by A. Creutz and presented in a paper called "College Graduates and the Professions in Nineteenth Century America" (MS Dearborn, 1980). The second U.S. figures describe the percentage of the professional service category among total American employment in 1870, 1900, 1920 and 1940. They were computed from D. Bell, The Coming of Post-Industrial Society (New York, 1973), 130.

tion and social change. Sociological theories stressing "educational mobilization" explain only the enrollment expansion and not even that very well. Since higher learning does not necessarily grow directly with population, the spread of literacy and the diffusion of primary schooling precede, but also sometimes follow, the expansion of the universities, as in Russia. The "partial modernization" approach seems more attuned to the contradictions in the differentiation process between scientific progress and academic traditionalism. It reconciles the proliferation of non-university institutions with the continued magnetism of the most elitist (Oxbridge) styles of higher learning. But its relevance for the other three topics is limited. The historical thesis of the active incongruence of higher learning with change helps to highlight the dichotomy between the commercial-industrial and the educational-bureaucratic middle class and points out the obstacles to mobility for the proletariat and other discriminated groups. But it overstates "the perpetuation of tradition" because "outlooks more or less explicitly at odds with their time" were not so prevalent in the technical and other non-university sectors and largely absent among scientists and doctors as

well. Instead, professionalization with its mixture of modern (science, skill, examination) elements with traditional (organization, autonomy, ethos) traits suggests as an alternative the ambivalence of modernization. The ambiguity of the relationship between education and social change emphasizes the dynamics of growth, diversification, social opening and professionalization while at the same time indicating their very real limits. The adjective "ambivalent" also describes the academics' conflict of emotions over the transformation of higher learning. While many enthusiastically welcomed its research advances, at the same time they pessimistically struggled against its decivilizing dangers.[38]

The ambivalence of this transition is evident in the different path followed by each country. Starting with comparatively low relative enrollment, England expanded vigorously by adding a host of new university, technical and teaching institutions which no longer conformed to the collegiate ideal. The social elitism of Oxbridge therefore gradually gave way to a still somewhat narrow but accessible system, especially for the lower class, since the hold of liberal education was broken by compensatory vocationalism. Beginning with higher enrollments, Germany increased more slowly, pioneering the model of scholarly specialization and higher technical or business education, but was more reluctant to include primary teacher training and other subjects. Its upper-class recruitment broadened only to include the new and old lower middle class while keeping out the proletariat. In contrast to English distrust between the professions and the universities, the association of state, higher education and professionals became even more intimate with *Bildung* giving way to *Ausbildung* (cultivation to professional training). With the lowest original enrollment, Russia made the most dramatic gains, less by expanding its universities than by creating numerous higher institutes, especially from the 1890s to the 1930s. Thereby the most elitist (noble) system was transformed into the most open (at least for the proletariat and peasantry) at the price of legal discrimination against the educated and propertied middle class. Instead of being content with democratizing the universities, the Bolsheviks rather promoted the training of proletarian cadres, immediately useful for the production process of the first Five Year Plan. Having the highest enrollment, because of the secondary role of much of undergraduate collegiate education, the United States experienced further growth and continued to lead the other three countries by 1930. The staggering diversity of religious, regional, social and academic characteristics of institutions persisted, although a graduate university sector in the European sense of the word emerged out of the traditional colleges after the Civil War. Because of its greatest initial egalitarianism (making some kind of educational certificate available to almost everyone who wanted it), there was less subsequent broadening of social access than in other countries. Curiously enough, professional education did not displace the liberal arts, but in a characteristic compromise, was added onto the

38. W. Rüegg, "Bildungssoziologische Ansätze zur Erforschung des Bildungswesens im 19. Jahrhundert," in his and O. Neuloh, eds., *Zur soziologischen Theorie und Analyse des 19. Jahrhunderts* (Göttingen, 1971); D. Rüschemeyer, "Modernisierung und die Gebildeten im Kaiserlichen Deutschland," *Kölner Zeitschrift für Soziologie und Sozialpsychologie, Sonderheft* 16 (1973), 515–29; Ringer, *Education and Society*, 6 ff., 18 ff. For the ambivalence of the educated cf. K. H. Jarausch, "Liberal Education as Illiberal Socialization: The Case of Students in Imperial Germany," *Journal of Modern History*, 50 (1979), 609–36.

undergraduate sequence for the most prestigious occupations while vocational training became a lower class token alternative.[39]

The causes of the transformation are ambiguous as well. In contrast to contemporary rhetoric about the contribution of higher learning to economic growth, it has been difficult to substantiate this connection beyond the effect of higher technical and managerial training. Instead, the spread of higher education seems to coincide with general "cultural and material progress" as a consumption good, afforded by more parents of modest means. Despite the covariation of enrollment and industrial production curves, predictions of demand have proved baffling for government statisticians while the market cycles of deficit and oversupply seem impervious to bureaucratic manipulation. The role of education in the emergence of class society is similarly contradictory. The shift from birth and wealth to expertise as a job requirement opened the doors for some meritocratic competition, but continued to favor the older elites. The formalization of legal entitlements (first on the Continent, but eventually also in the West) represented a typical liberal compromise between aspirations for mobility and self-perpetuation of the educated. Nevertheless the "social-aristocratic" tone of the cultured created one of the crucial status divisions of modern society. Despite the late 19th century belief in the progress of science and technology, the humanism inherent in liberal education continued to be attractive to students who craved its social distinctions. While the rationality of higher learning contributed to secularization, the classical content of cultivation sometimes turned academics away from the cacophony of the machine and the masses, making them profoundly uneasy about modernity. But exaggerated faith in rational knowledge and popular scientism fueled the expansion of scientific and technological subjects as social cure-alls as well. The rhetoric about academic freedom notwithstanding, the expansion of state funding also led to increased bureaucratic control which decided who got educated where and in what field. Though supporting science and technology, governments often tried to muzzle criticism coming from the universities.[40] Economic growth, social aspirations, cultural values and state policy, therefore served as essential motors of the transformation of higher learning across national frontiers.

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39. The extant data in Ringer, *Education and Society* and the above tables are too fragmentary to support anything but these preliminary impressions. According to issue, alignments of countries differ. In terms of expansion the established British and German institutions grew less dramatically than the emerging Russian and American systems. In terms of diversity the American and German systems seem to have held the lead, at least initially. In terms of social access Russia and Britain seem to have been the most open for the lower class by 1930. Finally in terms of professionalization the Anglo-American association-autonomy model appears to differ basically from the Continental (German-Russian) state-education model.

40. P. Lundgreen, "Educational Expansion and Economic Growth in Nineteenth Century Germany," in Stone, ed., *Schooling and Society* (Baltimore, 1976); W. G. Hoffmann, "Erziehungs- und Forschungsausgaben im wirtschaftlichen Wachstumsprozeß," in: G. Hess, ed., *Eine Freundesgabe der Wissenschaft für E. H. Vits* (Frankfurt, 1963), 101–33; R. Meyer "Das Berechtigungswesen in seiner Bedeutung für Schule und Gesellschaft im 19. Jahrhundert," *Zeitschrift für die gesamte Staatswissenschaft,* 12 (1968), 763 ff.; L. O'Boyle, "Education and Social Structure: The Humanist Tradition Reexamined," *Internationales Archiv für Geschichte der deutschen Literatur,* 1 (1976), 246 ff.; K. Vondung, ed., *Das Wilhelminische Bildungsbürgertum* (Göttingen, 1976).

But their particular strength varied in each context, their force was buffered by the relative autonomy of educational institutions, and their impact was mediated by the conflicting decisions of corporate groups and individual actors.[41]

The implications of the transformation of the university into "an expression of the age, as well as an influence operating upon both present and future" also raise a host of puzzling questions. In the transition from traditional elite higher learning to modern mass higher education the large, diverse, middle-class, professional system which emerged around the turn of the century represents an intermediary stage. Still echoing earlier ideals, higher learning performed by 1930 a far broader mission in society than a three-quarter century before. Although resented by a cultured minority, the expansion of enrollment beyond population growth moved universities from the periphery into the center of cultural life. Through incorporating "secondary, technical, vocational, and popular education", the diversified modern institutions played a crucial economic role in providing technological innovation and trained manpower. The cooptation of the lower middle class increased the chances for mobility or status preservation, and therefore helped legitimate the continuation of privilege as meritocratic. Finally, the political "adulteration and dilution" of the curriculum to include business, journalism, home economics, etc., contributed to the rise of ever new "professions". Nevertheless the emergence of "modern" higher learning before 1930 also encountered definite limits. No country outside of America enrolled more than 10% of the age cohort. Especially in the traditional British and German systems scientific differentiation did not mean the abandonment of the chair/institute system which restricted subjects to those deemed sufficiently "academic". Only in Russia were more than 10% of the students recruited from the bottom half of the population. Finally, even in the newest system the professionalization of vocational training did not include every new pretender to academic status such as "hair-dressing". The unresolved tension between modernity and tradition in this intermediary stage of higher learning contributed to those pressures which led to the next transformation, the emergence of mass higher education. In 1930 Abraham Flexner, in his grand comparison of American, English and German universities, could still cling to a vanishing ideal:

> A modern university would then address itself whole-heartedly and unreservedly to the advancement of knowledge, the study of problems, from what ever source they come, and the training of men—all at the highest level of possible effort.[42]

41. M. S. Archer, *Social Origins of Educational Systems* (London, 1979) and J. E. Craig, "On the Development of Educational Systems," *American Journal of Education,* 89 (1981), 189–211. Rather than nominalist abstractions, the intermediary linkages are crucial.
42. A. Flexner, *Universities: American, English, German* (London, 1930), 3–218. In 1967 Clark Kerr wrote in his introduction to the new edition with all the arrogance of the prophet of the "multiversity" before the student revolution: "The universities did all the wrong things—undergraduate instruction, professional schools (other than law and medicine), service activities, vocational courses, extension work. They did all the wrong things—and they entered the Golden Age." For the ideological reversal of the educated accompanying the social transformation see Jarausch, *Students, Society and Politics in Imperial Germany: The Rise of Academic Illiberalism* (Princetown, 1982).

Part One: The Dynamics of Expansion

Roy Lowe

The Expansion of Higher Education in England

The late nineteenth and early twentieth centuries saw a phenomenal and unprecedented growth in the provision of higher education in England. At the commencement of the period, in mid-century, there were but four small university institutions and a number of provincial colleges of varying prestige and clientele. For the vast bulk of the population education beyond elementary school had to be sought through Mechanic's Institutes or Adult Schools. Within eighty years this situation had been completely transformed through a process of growth and systematization. By 1930 the different elements in what could be discerned as a system stood in a clear relationship one to another, and identified themselves with particular social groups. Similarities with higher education in other major industrial societies were now more manifest: admission qualifications and ages were, by 1930, largely standardized; specialist faculties, each linking with professional occupations, had been established, and, more importantly, a definite hierarchy of educational institutions was discernible. How did this process occur in England between 1860 and 1930?

The Determinants of Expansion:

During these years higher education in England responded to a series of changes in the economic and commercial structure which impinged on all major industrial societies. The onset of what Fritz Ringer has called the "high industrial" phase of development involved the deployment of a far more highly skilled labor force than had previously been required as well as the swift expansion of ancillary professional services such as banking and accountancy. The first phase of British industrialization, centered largely on innovation and growth in the textile industries, was giving way to, and had helped to initiate, a second based to a greater degree on the development of coal and iron resources and the building of railways. In the seventy years after 1860 whole new industries emerged (machine tool, chemical, and electrical), with Britain becoming increasingly an industrial exporter, involved in heavy investment abroad. This growth in scale of both industrial and urban systems meant not only the rise of manufacturing regions but also more sophisticated transportation networks. Fueled by late-nineteenth century imperialism and by sharpened rivalry between nations,

these changes both depended upon and, in turn, stimulated the transformation of higher education.

Two consequences were immediately apparent. On the one hand there was a sustained and growing demand for vocational training. The number of workers in engineering, the machine tool industry and shipbuilding doubled between 1851 and 1881. Despite some employers' concern that technical education might lead to the dissemination of trade secrets, these new industries necessarily increased the demand for skilled and semi-skilled workers. The second outcome was a growing sensitivity to foreign developments. This intensified competition involved a new interest in how industrial rivals trained their work force. In 1881 the Samuelson Commission was ordered to "inquire into the instruction of the industrial classes in certain foreign countries in technical and other subjects and into the influence of such instruction on manufacturing and other industries at home and abroad."

Ironically, English contemporaries did not always perceive the need for change. Often the attention of those involved in the debate on higher education concentrated upon the need to preserve significant elements of the existing system in the face of sweeping changes. The rhetoric of the day emphasized the maintenance of traditional styles as much as the necessity to adapt to new circumstances. The way in which contemporary needs were perceived was to prove critical in shaping this emerging system.

Some developments appeared irresistible. This was certainly true of one of the most significant elements in the process of growth, the enhanced demand from below. The Schools Enquiry Commissioners estimated the number in receipt of grammar school education in 1861 as nearly 37,000. By 1931 there were a total of 433,517 children in recognized secondary schools. This growth was swiftest after 1902, when the newly formed Local Education Authorities assumed responsibility for secondary education. They participated in the virtual creation of a system of girls' secondary education. The implications for higher education were immediately perceived. As early as 1870, John Percival, headmaster of Clifton College, used the annual gathering of the National Association for the Promotion of Social Science to urge the Universities to recognize

> a whole class of schools which have sprung up in obedience to a national want.... Who can fail to lament the want of real living connection between our old universities and the great commercial and industrial centers? A great step will have been taken in this direction if the universities so reform themselves as to remain closely connected with the middle class schools, even those of modern aims and tendencies.[1]

Those involved in the debate on secondary education, which was itself rapidly expanding, demanded university reform in these terms.

As the industrial towns grew, and municipal politics became linked with civic pride, a more general critique of the isolation of the universities appeared. It was realized that local colleges, dispersed throughout the industrial north, could provide a cultural focus. Joseph Chamberlain emphasized this point in his frequently quoted 1898 pronouncement:

1. *Transactions of the National Association for the Promotion of Social Science,* 1870, 311–6.

To place a university in the middle of a great industrial and manufacturing population is to do something to leaven the whole mass with higher aims and higher intellectual ambitions than would otherwise be possible to people engaged entirely in trading and commercial pursuits.[2]

Equally, as Arthur Smithells, the Professor of Chemistry at the newly chartered Leeds University, spelled out, the time was ripe for the universities to replace their monastic ideal by a closer identity with these growing towns:

English education and English life have suffered to an almost incalculable extent by the isolation of our ancient universities. The want of geographical contact between the greatest seats of learning and the busy hives of industry ... have been attended by mutual disadvantages, and ... have placed in actual opposition two spheres of human activity that, in a well-regulated world, should be coincident.[3]

This was supplemented by the observation that, since the century had witnessed a shift of population to the northern towns, new foundations were needed to obviate the expense of living away from home.[4]

Although industrial development, a revitalized secondary school system and urbanization may be readily identified as three major factors influencing the development of higher education, there was never any identifiable consensus on the kinds of growth which would best meet the national need. However, in the ferment of ideas which were canvassed, some dominant arguments did recur.

Within Oxbridge, despite the reforms of the 1850s and 1870s, which had set fair to modernize those institutions, there was little readiness for sweeping change. The unpreparedness for innovation was well summarized by Edwin Guest, Master of Gonville and Caius, who, in 1870, proffered one of the more congenial responses to the relentless prodding of the Devonshire Commissioners:

Where there are so many conflicting interests to reconcile, it is obvious that prudence is necessary.... Precipitate action might do more harm than good. It would be, indeed, a sad thing if, in becoming "Physicists", we were to put into jeopardy the character of our University as the great mathematical school of Europe.[5]

That character involved adherence to the ideal of a liberal rather than a vocationally-oriented curriculum, and to a collegiate system fulfilling a strong pastoral role. For many dons, abandonment of these aims was too great a price to pay for the modernization of the two major universities.

But if Oxford and Cambridge were slow to initiate internal reform, one increasingly acceptable growth outlet, which reaffirmed the national function of the universities, was the nascent extension movement. This development, initiated by James Stuart in the early 1870s at Cambridge, with Oxford following just a few years later, arose from what one contemporary called "a widespread opinion in favor of a diversification of their revenues for the promotion of higher education in the great centers of population."[6] Increasingly, this movement, as it hardened into the Tutorial Class-

2. W. H. G. Armytage, *Civic Universities* (London, 1955), 243.
3. *University Review*, 21, No. 4 (January, 1907), 146.
4. M. Sanderson, *The Universities and British Industry, 1850-1970* (London, 1972), 3.
5. Evidence given on 30 June, 1870; see *Scientific Instruction*, H.M.S.O. (London, 1870), 3: 217-8.
6. *University Extension Journal*, 3 (October 1898), 27.

work of the early Twentieth Century, was viewed by critics as an attempt to mould a refractory and dangerous proletariat in the image of "the reasonable university man."[7] For its enthusiasts, men like Mansbridge and Tawney, this was seen in the years before the First World War as a device which might offer a broad "highway" to a democratized system of higher education, rather than the selective ladder established in the wake of the 1902 Education Act. It succeeded in bringing thousands into contact with university work, and in disseminating the ideal of a liberal education among the nation at large. It is no coincidence that those of the new university colleges which grew from local extension centers—notably Nottingham and Reading—subscribed more readily at the outset to a curriculum balanced between Arts and Sciences, and did not set about an immediate radical reconsideration of the ideal of a university.

At London, too, the introduction of external degrees in 1858 and the recognition of women students in 1878 provided the framework by which the university sponsored growth in other leading towns, although both concessions were made in response to the internal problems of the London colleges rather than with an eye to growth at the national level. Similarly, at Durham, close ties with the established church retarded innovation, a fact which elicited the scorn of Lyon Playfair in 1868:

> Though it does teach engineering just now, and does pay a nominal attention to science, it was so difficult, a few years ago, to get them to comprehend science in any enlarged aspect that I have not much hope of Durham. That university had a splendid opportunity of becoming a people's university for the great manufacturing counties in the north of England; but, being governed chiefly by clerical authorities, who naturally looked chiefly to the traditions of Oxford and Cambridge, the university has not taken root in the affections and sympathies of the population around it.[8]

For the subsequent structure of higher education in England this failure of the existing universities to commit themselves wholeheartedly to expansion was critical. The outcome was a whole series of new institutions aiming at a different clientele, and standing below Oxbridge and the London colleges in prestige. Further, the pre-existing universities compounded this contrast by ensuring that in those activities which did impinge upon the wider public—university extension and examining—the pattern was largely of evening teaching. Thus the precedent of a growth in "compensatory" higher educational agencies, soaking up demand which could not be met within the existing systems, was laid down at the beginning of the period under review.

In the major industrial cities the need for growth in higher education was readily perceived and forcefully articulated. The civic colleges represented a direct attack upon the concept of a university as a monastic institution offering a humane education in the liberal arts. Ironically, it was an Oxford scholar, J. R. Seeley, who most cogently spelled out the nature of the development foreseen, when, in 1887, he joined the debate on a Midland university:

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7. S. Rowbotham, "The call to University Extension teaching", *University of Birmingham Historical Journal,* 12, No. 1 (1969), 71.
8. *Scientific Instruction,* 1 (1868), 59.

It is desirable greatly to increase the number and to disperse over the country teachers of the particular type which is produced at the universities ... who have their knowledge at first hand, speak with authority each in his department, and speak to men. ... England, which till lately has had but two universities, will have a dozen.[9]

For Seeley, these new institutions should not be collegiate, on the Oxford model, nor must they dissipate themselves in examining. In sum their brief was to be the democratization of the knowledge of the age:

Modern civilization needs a vast quantity of science: the demand for trustworthy knowledge, scientific, sanitary, technical, economical, political, historical, moral and religious, rises with urgency from these great towns. Why should it not be met by universities founded everywhere?[10]

The debate on the founding of a Midland university, in which Seeley was joined by the professoriate of Mason College, Birmingham, elucidated most of the major strands of the argument on the kind of growth that was foreseen. In 1892, B. C. A. Windle, the Professor of Anatomy, emphasized the extent to which local needs should be met:

Every new university should be not merely the expression of a local desire for the best form of education, but should also be informed by the spirit and influenced by the peculiar nature of the pursuits of the district in which it is located ... we should not hesitate to strike out on new lines.[11]

E. A. Sonnenschein, the Professor of Classics, attempted to resuscitate the collegiate ideal with a proposal for a federated university with sister colleges at Nottingham, Bristol and Birmingham. His reasoning followed that which had led to the establishment of a federated Victoria University in the major northern cities a decade earlier.[12]

The real impetus to a full-blown attack on the existing university ideal stemmed from the exploration of foreign precedents. Seeley had suggested in 1887 that Heidelberg and Edinburgh both proffered valuable models of successful non-collegiate institutions. The Birmingham syndics dispatched in 1898 a three-man delegation to study Canadian and American practice. It was under their influence that W. J. Ashley was recruited from Toronto to lead the infant Faculty of Commerce at Birmingham. He immediately became the apologist for radical departures:

Birmingham does not dream of rivalling the two older universities in the studies particularly associated with them, like Classics, Maths., Philosophy and History. It will give its energies, and turn its resources, towards those fields in which they do little, and in which the loss of the amenities of college life is counterbalanced by the advantages derived from a position in the midst of a great industrial population ... accordingly our curriculum will be very elastic.[13]

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9. J. R. Seeley, *A Midland University* (Birmingham, 1887), 13–14.
10. Seeley, 13–14.
11. E. W. Vincent and P. Hinton, *The University of Birmingham* (Birmingham, 1947), 6.
12. Vincent and Hinton, 6.
13. W. J. Ashley, "The Universities and Commercial Education", *North American Review*, 15 (January 1903), 17.

Contentiously, Ashley went on to claim technical studies as the prerogative of the universities, citing Leipzig as the welcome exception among German universities in which commercial education was pursued at the highest level.

Similar arguments were adduced for the other civic colleges. At Leeds, local industrialists demanded a professoriate who would be "a general source of scientific enlightenment to the county."[14] Significantly, the Yorkshire College began work with no teaching in the Arts. It was only introduced under the influence of Cambridge Extension lecturers, and the first Professors in the Humanities were paid on a lower scale than their scientific brethren. At Liverpool, Ramsay Muir repeatedly emphasized that his college would offer the best vocational training: "A university is the only possible vitalising force for technical education which aims at developing capacity for a particular profession."[15] The protagonists of the new university colleges predicted a swift growth in the provision of technical and scientific places, although this was rarely, if ever, quantified.

There were significant addenda to the case for growth. One was the argument that more places must be made available for young women. Typical was Arthur Smithells, Professor of Chemistry at Leeds, who, inaugurating a course on Home Science at Kings College, London, in 1908, pleaded the feminist cause:

> We shall find plenty of young women of talent who have the inclination and the opportunity to devote a few years to this kind of higher education and who will return from it ready to enter with redoubled interest and usefulness into the realm of home life.[16]

A further reason, advanced initially in 1907 by Ramsay Muir, was that the university needed to be enlarged and democratised to ensure a supply of entrants to teaching. He pointed out that "this movement had enormously reduced the cost of university education, and brought it visibly within the reach of thousands to whom it had been unattainable. Hence has come a remarkable increase in the 'natural supply' of teachers, adequately trained at their own expense."[17] To further this process, he argued, the inadequate courses currently offered in the university day training departments should be replaced by one-year professional training following on a three-year undergraduate course. Four years later this scheme was formally adopted.

Meanwhile, the case for an expansion of vocational and technical training outside the universities was also being made. By 1870 the proselytising of Lyon Playfair and his associates had led to a Select Committee and a scheme for a National Technical University. Working through the Science and Art Department, and, after 1887 the National Association for the Promotion of Technical Education, this lobby argued consistently for governmental backing for new initiatives. The outcome was not only the first steps (from 1889) to fund the new university colleges, but also the appearance of separate institutions, financed in part by the Science and Art Department and in part from local rates, devoted to technical education. The City and Guilds College, 1881, and the Regent Street Polytechnic, acquired by Quintin Hogg in the same year, were crucial precedents, establishing the model of technical institutes out-

14. A. N. Shimmin, *The University of Leeds* (Cambridge, 1954), 10.
15. Shimmin, 25.
16. *University Review*, 40 (1909), 246.
17. *University Review*, 22 (1907), 349.

side and below the university sector. In response to the accusation that he had neglected cultural studies, Hogg replied: "I did not include the subjects you mentioned for fear of attracting a class of young men of a higher education status than those for whom the institute was intended."[18] Against this background, the rift between the university and non-university sectors hardened, so that by 1910 the Commission on University Education in London was able to report: "Universities are institutions for making officers; the polytechnics were intended to be institutions to make the rank and file the most capable rank and file in the world."[19]

Throughout this period the evening school movement gained force. In a strong plea for technical education in evening schools in 1905 C. H. Creasey emphasized that "one of the most pressing educational needs of the next few years, is to adapt instruction to the capacity of a larger number of earnest students."[20] Similarly, in the *University Review* four years later, W. J. Bees, a schools' inspector, argued for a vast increase in technical education if British industry was to match that of Germany, where a quarter of the work force had received a technical training:

> Higher education for the great mass of people in industrial districts must be evening education ... a steady flow of evening students should pass from the advanced technical institutions to the university. This will enable the university to fulfill its function as the head of the evening school scheme in great industrial and commercial districts.[21]

In these terms the locally financed Technical Colleges and Evening Schools, which together constituted the fastest growing sector of English higher education, were condemned to inferior status.

The Pattern of Growth:

How did these new demands relate to the pattern of actual developments between 1860 and 1930? Any statistical treatment is open to the charge that figures presented at the time were often not accurately researched or contained their own internal inconsistencies. But with the introduction of annual returns from university colleges in 1893 and the centralization of records through the Board of Education after 1899, these problems decreased during the later part of the period under review.[22]

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18. S. F. Cotgrove, *Technical Education and Social Change* (London, 1958), 63.
19. Cotgrove, 64.
20. C. H. Creasey, *Technical Education in Evening Schools* (London, 1905), 5.
21. *University Review*, 43 (1909), 498.
22. The statistics presented are drawn from a variety of sources, most notably:
    Annual Reports of the Committee of Council on Education,
    Science and Art Department Annual Reports,
    Board of Education: *Annual Reports,*
    Statistics of Public Education,
    Lists of Schools,
    Reports from University Colleges (Annual, 1893–1920),
    Returns from Universities and University Colleges, in receipt of grant (Annual, 1920–31),
    Cambridge Historical Register,
    Oxford Historical Register,
    Royal Commissions on Oxford and Cambridge (1874, 1922),

Throughout these figures census years have been used to provide a sample which is readily comparable with overall population trends. However this technique runs the risk of distortion through the particular circumstances of individual years: for example, 1921 saw the zenith of the brief post-war economic expansion and an abnormally high demand for educational facilities from newly demobilized troops. Nonetheless, over the long run these decennial returns are a sufficiently reliable guide to the overall growth of the English system.

Broadly, the pattern which emerges confirms that pre-existing university institutions were slow to respond to changed circumstances. Consequently much work developed in relatively new institutional forms unhampered by a traditional role and readier to adjust to the demands of expansion. Because of contemporary ambiguity over precisely what constituted higher education, it was necessary to review the whole post-school provision, including work which was often of low status, but which catered to those social groups unable to aspire to a university education for historical reasons. In a country with clearly defined class boundaries, where the existing universities remained the preserve of the privileged, the shift towards a schooled society, far more of whose members aspired to higher education, took place through new "compensatory" institutions which, for reasons associated with class exclusivity, were not immediately granted recognition as institutions of higher learning. This eclectic approach is further justified, because, as part of the gradual professionalization of society, the artisans and skilled workers who looked to the adult movement or to technical classes for their own education, were themselves, in turn, to father the first-generation university entrants of the mid-twentieth century.

Even for the pre-existing universities of Cambridge, Oxford, London and Durham (Table 1) it is impossible to be entirely confident of student numbers, although these figures, researched independently, are sufficiently close to those put forward by Stone for Oxbridge to indicate that both are fairly near the mark.[23] They suggest an eight-fold growth in this sector during the whole period, with the greatest expansion occurring in the newer institutions. Thus, the figures lend credence to the view that Oxbridge was far from wholehearted in accommodating to change.

Within the new provincial university colleges (Table 2) growth was even more startling. In each case returns are shown for the original foundation from which the later university developed. Where estimates have been made, they are based on individual college histories and the best available secondary sources. Although, even by 1931, none of these universities could compare in size with Oxford, Cambridge or London, in total they constituted a new sector of higher education, with a maximum student capacity, towards the end of the period, nearly thirty times as great as that at the outset.

University Yearbook,

Census Reports, 1861–1931,

M. Greenwood, "University Education", *Journal of the Royal Statistical Society,* 48 (1935), 241.

Where these sources failed to provide information, resort was made to works on individual colleges, cf. H. Silver and S. J. Teague, *The History of British Universities, 1800–1969: A Bibliography* (London, 1971).

23. L. Stone (ed.), *The University in Society* (Oxford, 1975), 1: 91–2.

Table 1: Full Time Students in Pre-Existing Universities

	CAMBRIDGE	OXFORD	LONDON	DURHAM	TOTAL
1861	1,200*	1,200*	375*	50*	2,825
1871	1,750	1,940	300	70*	4,060
1881	2,400*	2,310	700	300*	5,610
1891	2,700*	2,400*	1,100*	350*	6,550
1901	3,080	2,800	900*	250*	7,030
1911	3,970	3,400	4,120	900*	12,390
1921	5,900	4,440	6,950	1,200*	18,490
1931	5,600	4,572	10,281	1,446	21,899

*Approximation based on returns of graduates for one year only.

Table 2: New University Foundations

Total Numbers of Enrolled Students

	1861	1871	1881	1891	1901	1911	1921	1931
Birmingham			200	650*	749	1,017	1,923	1,630
Bristol			350*	450*	542	834	1,045	954
Exeter				100*	200*	300*	450	650
Hull								100
Leeds			463	973	958	1,168	2,334	1,884
Leicester							9	100*
Liverpool				1,290*	974	1,401	2,665	2,220
Manchester	500*	1,000	1,100	1,300*	1,194	1,660	2,397	2,477
Newcastle	60	200	350	1,900*	1,612	1,435	1,628	1,411
Nottingham			1,600	1,600	1,914	1,906	1,075	1,551
Reading					500*	1,083	563	641
Sheffield			400	500	1,266	2,500	1,072	965
Southampton		270	500*	700*	900*	738	940	772
TOTAL	560	1,470	4,963	9,463	10,809	14,042	16,101	15,355

*Estimate

Perhaps the most significant change concealed by these global figures is the decline of part-time teaching in these institutions (Table 3). At their outset several of these colleges proliferated evening and day-release courses, most aimed at young

Table 3: Ratio of Full-Time to Part-Time Students in Provincial University Colleges

		1893	1901	1911	1921	1931
Birmingham	FT	409	435	868	1,809	1,446
	PT	291	314	149	114	184
Bristol	FT	412	334	467	1,008	905
	PT	293	208	357	37	49
Leeds	FT	400	746	660	1,610	1,510
	PT	501	212	503	724	374
Liverpool	FT	517	683	919	2,314	1,747
	PT	776	291	482	351	473
Manchester	FT	987	1,048	1,374	2,006	2,107
	PT	320	146	286	391	373
Newcastle	FT	482	502	652	1,212	1,058
	PT	1,478	1,110	783	416	353
Nottingham	FT	431	446	242	776	644
	PT	1,329	1,696	1,664	299	907
Sheffield	FT	158	361	354	947	749
	PT	103	905	2,164	125	216
Reading	FT			335	549	626
	PT			748	14	15
Southampton	FT			204	343	474
	PT			534	597	298

Table 4: Ratios of Female Students in Provincial University Colleges

	1893		1901		1911		1921		1931	
	M	F	M	F	M	F	M	F	M	F
Birmingham	365	335	368	381			1,354	455	985	461
Bristol	387	318	345	197			681	327	572	333
Leeds	354	46	428	139			1,288	322	1,131	379
Liverpool	447	120	559	124			1,766	548	1,203	544
Manchester	-	-	-	-			1,425	581	1,476	631
Newcastle	1,545	415	1,364	248			980	232	783	275
Nottingham	-	-	-	-			650	126	447	197
Reading	-	-	-	-			214	335	250	376
Sheffield	194	67	1,118	87			751	196	568	181
Southampton	-	-					198	145	305	169

no return presented

workers in local industries. When this function was taken on by technical colleges, and as industry increasingly demanded training through full-time courses, the pattern changed, with only those colleges which had derived originally from a strong local university extension tradition, such as Nottingham, resisting the trend until at least the First World War. The figures suggest, too, that the contraction of part-time work coincided not with the granting of full university status but with the First World War, after which no institution resumed its earlier character completely. Even Leeds, which retained large numbers of part-time students into the 1920s, eroded their part in the university by a rapid expansion of full-time capacity.

It is also interesting to consider the extent to which this growth enhanced the opportunities for women to pursue academic training (Table 4). It becomes clear that the provincial colleges were, from their inception, at least accessible to women, and, so far as one can generalize, there seems to have been little change in the ratio of men to women, despite the swift growth in overall numbers. Women remained outnumbered by three or four to one at most institutions. The two exceptions were Birmingham and Bristol, where expansion involved vastly increased numbers of male entrants while the female portion remained static in size, representing a decreasing proportion of the student body.

Another significant development in these colleges was the growing concentration upon teaching to degree level (Table 5). The first returns from the colleges show only a small minority of students proceeding to degrees. At Mason College, Birmingham in 1893, only 14 of 700 students received London external degrees. This was not untypical. In the same year 13 graduated from Bristol, 13 from Leeds, 123 from Manchester, and 17 from Nottingham. From 1911 onwards, when more systematic records are available, a majority of students were on degree courses. This concomitant of recognition as a university was part of the process by which the provincial colleges established their position in the status hierarchy. Degree courses gave access either to professional posts or to managerial positions within industry. Thus, as the period progressed, the university colleges neglected increasingly the skilled artisans whom, it had been foreseen, they might train.

But below these aspirant university colleges there was a plethora of institutions offering technical education of one sort or another. A useful index of the development of this sector is furnished by the annual returns of recognized classes and students, first to the Science and Art Department, and subsequently to the Board of Education (Table 6). The tradition of part-time study in these institutions was never seriously threatened. By 1931 only 8,000 students, from a cohort of over a million, were studying full-time in technical colleges. These were, in the main, products of elementary schools financed by either L.E.A. or industrial scholarships. The Clerk Report of 1931, which examined these colleges indicated no desire, from industrialists or educationalists, to see the English tradition of part-time technical education modified.[24] The needs of British industry were to be met by the elementary schools, with a leaving age raised to 15, or by technical secondary schools, newly sanctioned by fashionable psychological theory. Thus, technical education remained low in prestige and failed to establish clear routes to managerial positions throughout the period under

24. Clerk Report, *Education for the Engineering Industry*, H.M.S.O. (London, 1931).

Table 5: The Growth of Work at Degree Level

	1910 - 11			1920 - 21								1930 - 31							
	FULL TIME STUDENTS			FULL TIME STUDENTS								FULL TIME STUDENTS							
	Degree	Diploma	P.G.	Research		P.G.		Degree		Diploma		Research		Others		Degree		Diploma	
				M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Birmingham	565	242	19	42	22	1	16	1,073	244	238	173	57	17	0	0	7	3	265	155	179
Bristol	232	226	9	11	0	9	23	360	216	301	88	34	10	0	0	411		260	127	63
Leeds	409	108	18	11	6	6	10	817	287	454	19	57	16	0	0	832		242	242	121
Liverpool	679	199	37	22	0	8	28	1,198	473	538	47	36	3	0	0	844		391	323	150
Manchester	936	295	117	46	21	16	35	1,125	490	238	35	57	14	4	1	1,019		503	396	113
Newcastle	458	165	2	7	1	26	8	741	184	86	2	17	2	0	0	610		194	156	79
Nottingham	133	102	6	8	1	8	3	252	43	382	79	13	0	0	0	184		72	250	125
Reading	115	125	11	4	1	0	1	109	129	101	124	8	11	0	1	147		171	195	193
Sheffield	215	76	7	13	0	12	23	469	168	257	5	30	3	1	0	416		139	121	39
Southampton	99	103	2	3	1	1	6	98	67	96	71	2	0	0	0	146		78	157	91

Table 6: Students in Receipt of Technical Education in Recognized Classes

	Schools	Classes	Pupils under Instruction
1861	38		1,330
1871	908		38,015
1881	1360	4839	61,177
1891	2164	8568	148,408
1901			
	In day science classes		66,384
	In evening science classes		98,673
	In day art classes		52,533
	In evening art classes		67,854
		TOTAL	285,444
1911			
	In day technical institutes		3,024
	In day technical classes elsewhere		11,329
	In evening and similar schools		708,259
	In schools of art		41,292
	In art classes elsewhere		3,217
		TOTAL	767,121
1921			
	In technical schools		5,434
	In day technical-classes		15,976
	In Schools of Art		48,109
	In art classes		3,611
	In part-time technical instruction		866,567
	In part-time technical courses		781,619
	In day continuation courses		55,261
		TOTAL	1,776,568
	(The returns for 1921 are for England and Wales.)		
1931			
	In technical colleges		8,030
	In day technical classes		27,819
	In art schools		58,700
	In day continuation schools		20,656
	In evening institutions		905,786
		TOTAL	1,020,991

review. Its growth was phenomenal, but was accomplished through the extension of part-time facilities.

The third major area to be considered in any overview of higher education is that of teacher training. It provided one of the most significant pioneer routes for social

mobility, with the vast majority of entrants coming from working-class or lower-middle class origins and gaining job-security in the difficult conditions of the early twentieth century. This was, too, an area in which women preponderated, suggesting that teacher training may well have been a common outlet for able girls who could not aspire to a university education (Table 7).

The vagaries of the English system render a precise comparison with other societies, in which categories of students may be clearly delineated, difficult. In England, for example, medical education became the concern of the universities by the mid-19th century, and, for most of the period, university statistics subsume the vast majority of medical students. Legislation in 1858, which standardized admission to the Medical Register, soon led to all training taking place either in the universities or in medical schools which came under their auspices.[25] Legal training, too, became linked more usually with a university education in the late 19th century, although some census reports give returns of law students outside the universities. In 1881, for example, there were 1,600 such students, but, unfortunately, similar statistics are not available for the whole period under review. It would be reasonable to assume that the figures given here omit a significant number of trainees for professional posts who cannot be readily quantified. They also overlook the host of students in the adult education movement, Mechanics Institutes, Athenaeums and the like. Since many of these had a substantial social membership, any accurate assessment of their educational functions is difficult. There is a risk, too, that the figures presented here involve some double counting, since some training colleges were recognized as Science and Art centers with students listed in the official returns of Technical Colleges.

Despite these reservations, it is possible to attempt a rough index of the numbers in receipt of some kind of post-school education in England during the period under review (Table 8). It shows that the ten-fold growth in the numbers attending university and teacher training college was far outweighed by the growth of part-time technical education. Thus, while the right-hand column suggests that a dramatic transformation came over English society, with some kind of post-school education becoming a real possibility for many young people, it must be remembered that most of this took place in the low-prestige, part-time "compensatory" institutions whose development allowed the universities to remain above the hurly-burly of this change.

Setting these figures alongside the overall population trends for England and Wales, makes it possible to depict the student body as a percentage of the total population and of the 20–24 age group (Table 9). Thus, these years saw an increase of nearly six times in the likelihood of any individual receiving a university education, and of eighty times in access to some kind of post-school educational experience.

Finally, the statistics of growth decade by decade show the universities responding to slightly different stimuli than those influencing the technical sector (Table 10). For the universities the 1870s and 1880s were the two major growth periods, while in the technical sector the 1860s and 1880s were clearly the more significant periods. In both sectors the first decade of the century saw an upturn in growth which was not subsequently matched.

In brief, these statistics give credence to the hypothesis that in England a diverse and highly-stratified system of higher education developed partly as a consequence

25. R. M. Walker, *Medical Education in Britain* (London, 1965).

Table 7: Students Training to Teach

		No. of colleges	M	F	Total
1861	Church of England	15	905	844	1,749
	British	1			121
	Wesleyan	1			114
	Roman Catholic	3			145
	TOTAL				2,129
1871	Church of England	22	835	781	1,616
	British	3	140	203	343
	Wesleyan	2	125	105	230
	Congregational	1	22	25	47
	Home and Colonial	1	0	140	140
	Roman Catholic	2	63	88	151
	TOTALS	31	1,185	1,342	2,527
1881	Church of England	25	904	1,199	2,203
	British	3	130	200	330
	Wesleyan	2	117	109	226
	Congregational	1	23	32	55
	Roman Catholic	3	42	146	188
	TOTALS	34	1,216	1,686	3,002
1891	Church of England	26	916	1,198	2,114
	British	4	137	255	392
	Wesleyan	2	119	109	228
	Roman Catholic	3	44	186	230
	Undenominational	2	33	129	162
	TOTALS	37	1,249	1,877	3,126
1901	In training colleges	64	2,192	3,610	5,802
	Being taught part-time in pupil teacher centers	38	506	643	1,149
	TOTAL				6,951
1911	Training for elementary teaching		3,870	7,295	11,165
	Training for secondary teaching		37	145	182
	Training for domestic science teaching			910	910
	TOTAL				12,257
1921	Pupil teachers in centers		597	2,745	3,342
	Pupil teachers not in centers		159	1,710	1,869
	Student teachers		5,741	10,930	16,671
	TOTAL				21,882
1931	Pupil teachers in centers		150	198	348
	Rural pupil teachers		120	565	685
	Student teachers		6,757	12,727	19,484
	TOTAL				20,517

Table 8: Total Numbers in Receipt of Post-School Education in England

Year	Oxbridge, Durham and London	Provincial Universities	Total No. of Students in Universities and University Colleges	Technical Education	Teacher Training	Total (Nearest 100)
1861	2,825	560	3,385	1,330	2,129	6,800
1871	4,090	1,470	5,560	38,015	2,527	46,100
1881	5,610	4,950	10,560	61,177	3,002	74,700
1891	6,550	9,463	16,013	148,408	3,126	167,500
1901	7,030	10,809	17,839	285,444	6,951	310,200
1911	12,390	14,042	26,414	767,121	12,257	805,800
1921	18,490	16,101	34,591	1,400,000*	21,882	1,456,400*
1931	21,900	15,355	37,255	1,020,991	20,924	1,079,200

*Estimate

Table 9: Students as a Percentage of Population (All Figures in Thousands)

Year	Total Population	20-24 Population	University Students		All Students	
			as % of total population	as % of 20-24 age group	as % of total population	as % of 20-24 age group
1861	20,066	1,829	0.016	0.185	0.035	0.383
1871	22,712	2,004	0.024	0.277	0.203	2.296
1881	25,974	2,328	0.040	0.453	0.289	3.222
1891	29,003	2,646	0.055	0.605	0.579	6.350
1901	32,528	3,120	0.054	0.572	0.953	9.936
1911	36,070	3,175	0.073	0.832	2.235	25.386
1921	37,887	3,151	0.091	1.098	3.843	46,208
1931	39,952	3,494	0.093	1.066	2.701	30.882

Table 10: Percentage Growth per Decade in Student Numbers

Year	University Students	All Students
1861-71	164	657
1871-81	190	163
1881-91	152	224
1891-1901	111	184
1901-11	148	260
1911-21	131	180
1921-31	108	74

of the unreadiness of existing universities to respond fully to social change. In this process, the role of the emergent university colleges was crucial. In the event, their aspiration to break from the "technocratic" model and to conform with that of the Oxbridge college drove a wedge between "humane" and applied studies which was to prove immensely significant for English society in the twentieth century. It is that process which will be examined in conclusion.

The Dynamics of Growth:

It is clear that all these developing institutions wished to appear academically respectable. This was nowhere more true than in the provincial university colleges, where a recession from the "technological" ideal, and from part-time teaching, excluded many who turned instead to the technical colleges. Within the newly-chartered universities in the early twentieth century, much energy was devoted to the resuscitation of the liberal arts. It is significant that the Yorkshire College at Leeds was at first excluded from the federated Victoria University on the grounds that its curriculum was insufficiently balanced, failing to offer a liberal education. No sooner was the new University of Birmingham legitimized by the grant of a charter in 1900 than its first Vice-Chancellor, Oliver Lodge, was lamenting "the unfortunate impression abroad that Birmingham either does not possess or does not encourage a Faculty of Arts. This impression has an obvious historical origin."[26] Under his energetic guidance, the arts faculty had trebled in size within twelve years. By 1905 Lodge was already claiming that a general B.A. at Birmingham could offer "a general education in the knowledge of the time."[27] This shift towards arts and pure science rather than applied science was not universally welcomed. In 1911 a local ratepayers' association angrily petitioned the Privy Council:

> So far as the Birmingham University as such is concerned, it is of no use whatever to the industrial classes; as far as we can see all that has been done by the merging of Masons Science College into the University has been to divert the funds intended for ... the industrial classes to the

26. Vincent and Hinton, *op. cit.*
27. *University Review,* 2 (1905), 31.

use of the wealthy classes, and now the middle and working classes are being asked to contribute towards the education of the wealthy and well-to-do.[28]

This process seems to have been sustained into the inter-war years and paralleled elsewhere. In 1918, Sir Charles Grant Robertson, the Dean of Arts, lamented the general impression that Birmingham University was no more than a glorified school of applied science.[29] Under his direction the policy of vigorous expansion in arts was maintained. Similarly at Leeds, both Michael Sadler and J. B. Baillie, who succeeded him as Vice-Chancellor, attempted to resurrect the collegiate ideal, pressing the scheme of a "community housed in a pleasant landscape around an artistic set of buildings."[30]

This reversion from the applied sciences reflects the strength of the university model with which the late-nineteenth century pioneers had tried to break. It also probably indicates the class exclusivity of higher education, as dons in the new provincial colleges began to fear they were ministering, through applied science, to social groups for whom the university was not the proper preserve. It must not be forgotten, too, that, during this period, the provincial colleges were largely staffed by the products of Oxbridge. At all events, whatever the reasons, there seems to have been some retrenchment along traditional lines in the Redbrick Universities in the years after 1900.

Within the technical colleges there were also growing reservations concerning the extent to which the universities had usurped major responsibility for vocational instruction. In 1909, George Beilby told the Association of Technical Institutions that the time was ripe for its members to reclaim prime responsibility for technical training:

> Some of the universities have given us a noble lead in our earlier development, but I am bold enough to think we have outgrown that lead. ... I discriminate sharply between the function of the technical college, the training of large numbers of competent craftsmen or professional men, and the development of a smaller class of scientific pioneers.[31]

Another element in the dynamic of change was the increasing involvement of the state in planning the function of these higher educational agencies. As Armytage has pointed out:

> The civic universities in their struggling years, and the university colleges all along, owed the very existence of their arts faculties and in many cases their pure science faculties to the presence of a large body of intending teachers whose attendance at degree courses was almost guaranteed by the state.[32]

By the early twentieth century the pattern of growth in all areas was effectively controlled and directed by governmental agencies. This development had been prefigured by the Samuelson Report, which called for state funding of scientific enterprise, and by the Devonshire Commissioners who, in 1875 had gone so far as to rec-

28. Public Record Office, Education 119/1.
29. Vincent and Hinton, 106–7.
30. Shimmin, 38.
31. *University Review*, 45 (1909), 643–6.
32. Armytage, 256.

ommend that under a Ministry of Science the state should assume general responsibility for the direction of scientific instruction at every level.[33] But it was the growth in numbers, accompanied by the development of significant industrial and scientific research at the universities, in brief the move of higher education to a more significant position within the economy, which impelled the anxious governmental supervision of all new departures and expansion. From 1889 a Treasury Committee, prefiguring the U.G.C., disbursed grants to the new colleges. In response to Fabian demands the annual commitment grew to £ 54,000 by 1904. A separate Development Commission, concerned to ensure the supply of food for a growing population, became an important agency sponsoring agricultural education and research. By at once depriving British industry of vital German products the 1914 war provided a further twist. The D.S.I.R. (1915) and the formalization of the U.G.C. (1919) were direct consequences of the radically changed situation resulting from this crisis.

This governmental involvement was frequently cloaked in a "laissez-faire" philosophy which disguised the degree to which central management went on. In July, 1910, for example, Lloyd George fobbed off an anxious deputation from Southampton, where local aspirations for a university were currently under threat, with a demand for greater local initiative. He compared Southampton unfavorably with Bangor,

> with only 15,000 in a North Wales town, where there are no great industries, no great liners running to South America, no Cunarders. ... I am sure you will agree with me you can do more. I, as long as I am here ... want to know what the localities are prepared to do. When you come into contact with Chancellors of the Exchequer and ask us to do this or that for the locality, we are all alike in one respect: we help those who help themselves.[34]

Perhaps a truer index of the close involvement of the government at this period is provided by the exhaustive report supplied by G. T. Beilby, who was in 1914 commissioned to inspect, for the Board of Education, all departments of Applied Chemistry.[35] Indeed, many academics at this time feared the stultifying influence of governmental planning. In 1911, Oliver Lodge pleaded with the Board of Education for greater autonomy in planning courses:

> The increased Government grant raised ... many important questions as to the autonomy of universities in the management of their own affairs. Universities ... should not become appendages of State Departments of the Civil Service. ... The only reasonable way was to trust the institutions and the experts called together to manage them.[36]

It is possible, then, to discern two major elements in the dynamics of growth. First, traditional elite views of the function and style of a university clearly influenced the pattern of growth of the new university colleges. Secondly, enhanced size and economic significance attracted greater financial support from the state, and with it a growing determination to oversee the structure of this developing system. With hindsight, the claim that the role of the U.G.C. was advisory rather than supervisory until at least 1950 seems to lack validity.

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33. Devonshire Committee, *Scientific Instruction, Eighth Report* (London, 1875), 27.
34. P.R.O. Ed. 119/67.
35. P.R.O. Ed. 119/27.
36. P.R.O. Ed. 119/1.

Perhaps paramount in determining the pattern of expansion was the strong sense of hierarchy within English higher education, which was briefly threatened by the kaleidoscopic nature of these changes but which, in the event, remained as strong in the 1920s as seventy years earlier. In 1882 William Siemens had argued to the Samuelson Commissioners the distinctiveness and preferability of the university to the polytechnic.[37] In 1902, Ashley was keen to emphasize that his infant Faculty of Commerce at Birmingham had as its primary object

> the education, not of the rank and file, but of the officers of the industrial and commercial army: of those who as principals, directors, managers ... will ultimately guide the business activity of the Empire.[38]

In the *University Review* three years later, W. McDougall claimed that Oxbridge life was "on a different and altogether higher plane"[39] than that enjoyed in other institutions. Similarly, in 1932, Ernest Barker was not alone when he warned that "it is a great mistake to blur the distinction between university and technical college."[40] The grounds on which the case was made may have shifted in response to a changed situation, but the central point remained, that English society was best served by a clearly designated and hierarchical system of higher education, with democratization taking place through new compensatory institutions rather than the complete restructuring of the old. If we are to seek a single most potent factor in explaining the peculiar structure of higher education which emerged in England between 1860 and 1930, it is probably to be found in a national preoccupation with social hierarchies.

37. Evidence given in March, 1882; see *Technical Instruction*, 3 (London, 1883).
38. W. J. Ashley, *The Faculty of Commerce in the University of Birmingham; its Purpose and Programme* (Birmingham, 1902).
39. *University Review*, 7 (1905), 147.
40. Armytage, 267.

Hartmut Titze

Enrollment Expansion and Academic Overcrowding in Germany*

The development of university enrollments in Germany during the last 200 years shows some remarkable patterns. Increases and decreases, succeeding one another in long, cyclical movements, suggest that academic careers experience surplus and deficit situations which move like the tides across the generations. Since the 18th century, four phases of development can be identified during which access narrowed due to a partial or general overcrowding of academic professions:

In the first phase from 1780 until shortly after 1800, the two major careers (Protestant clergy, jurists and cameralists in higher government service) were overcrowded in Prussia and in northern Germany. Even before the Prussian collapse in 1806 there were references to "so many old candidates for whom there are no positions".[1]

In the second phase, following a deficit "immediately after the war," a great prerevolutionary oversupply crisis in academic careers began in the middle of the 1820s. Along with law graduates, it especially affected Protestant theologians and also touched secondary teaching, a career newly established in connection with the educational reforms. Whereas the "overproduction" of lawyers "had already run its course by the middle of the 1830s," the much more profound crisis of the Protestant clergy continued into the 1840s and diminished only in the 1850s since the excess of candidates decreased only gradually.[2]

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* This essay was translated from the original German by Hannelore Flessa-Jarausch.

1. *Allgemeines Repertorium für die theologische Literatur und kirchliche Statistik,* 30 (1840), 72–86; W. Dieterici, *Geschichtliche und statistische Nachrichten über die Universitäten im preußischen Staate* (Berlin, 1836), 120 ff.
2. J. G. Hoffmann, *Sammlung kleiner Schriften staatswirthschaftlichen Inhalts* (Berlin, 1843), 204ff.; J. R. Gillis, *The Prussian Bureaucracy in Crisis, 1840–1860* (Stanford, 1971); W. Bleek, *Von der Kameralausbildung zum Juristenprivileg* (Berlin, 1972); *Allgemeine Kirchenzeitung,* 7 (1828), 58, 467–469; H. Titze, "Lehramtsüberfüllung und Lehrerauslese im Obrigkeitsstaat. Zur Steuerung des Lehrernachwuchses im Königreich Hannover 1830–1865," *Die Deutsche Schule,* 73 (1981) 19–30; J. Conrad, *Das Universitätsstudium in Deutschland während der letzten 50 Jahre* (Jena, 1884), 105; G. Schlosser, *Über die Abnahme des Studiums der Theologie* (Leipzig, 1873), 2.

This lengthy overcrowding was still a living memory when, in the Wilhelmian Empire, the third phase, a renewed oversupply in academic careers arose which spread to almost all disciplines by the century's end. In comparison to the earlier crisis, the oversupply problem of the 1880s and 1890s took a more critical form. With the expansion of most academic careers, the number of those affected reached into the thousands for the first time. The oversupply crisis also included more careers than in the first half of the 19th century; the previously mildly affected professions of doctors as well as secondary school and university teachers were now fully involved.[3]

With the predicament of a slowly growing academic employment market, the continual oversupply problem found its sharpest expression in Germany to date in the 1920s and 1930s, the fourth phase. Preceding the drastic Nazi measures, the pool of "superfluous" graduates threatened by the "academic job crisis" rose into the tens of thousands. The Weimar crisis was complicated by the historically new factor of female study which expanded greatly in the second half of the 1920s.[4]

To the individual it seems an unfortunate accident to be born into a generation for whom access to academic careers is more restricted than for the preceding or following cohorts. But if this decrease in opportunities regularly recurrs, the question arises if there is not an underlying socially produced mechanism whose effects can be investigated.

Research in this area is only beginning. This essay sketches a cycle theory which attempts to illuminate the recurrence of continual surplus and deficit crises in academic careers in Germany. This study is based on the voluminous empirical material of about 1.5 million data on university history collected and investigated quantitatively by the QUAKRI research project. Since the analysis has not yet been completed, only interim results, summarizing the state of the inquiry at the end of five years, can be presented.[5]

Fluctuation, Intensity and Social Recruitment of Students:

The initial investigation pursued the question of whether or not specific enrollment patterns in different academic disciplines varied in their degree of fluctuation. In order to subject their frequency curves to a strict non-impressionistic analysis, the general trend was isolated from the cycles to be studied.[6] On the basis of such a general

3. U. Herrmann, "Historische Pädagogik," 14. *Beiheft* of the *Zeitschrift für Pädagogik* (1977), 13–128.
4. R. Schairer, *Die Akademische Berufsnot* (Jena, 1932).
5. Since 1975 at the Pädagogisches Seminar of the Göttingen University, a research group (under the direction of Hans-Georg Herrlitz and Hartmut Titze) has been analyzing oversupply crises in academic careers (especially in secondary school teaching) in 19th and 20th century Germany. From 1977 on these investigations have been supported by the Deutsche Forschungsgemeinschaft within the comprehensive QUAKRI project (i. e., *Qualifikationskrisen und Strukturwandel des Bildungswesens*), directed by Detlev K. Müller. Its voluminous statistical materials will be published as a data handbook on German educational history. Those quantitative sources which cannot be included for reasons of space will be printed there.
6. The problem of what methods to use in determining trends cannot be discussed in this essay. To ensure that the results of the analysis are not statistical artifacts, different procedures of

trend, a time series of relative cycle values was calculated for student enrollments in specific faculties. These values indicate to what extent a cyclical increase goes beyond or falls below the "normal" level of the general pattern. The values oscillating around 100 thus present a graphic picture of the wave-like enrollment patterns. The differences in the cycle values from one half-wave to another were related to the time in which the increases and decreases occurred. The different intensities of the cyclical fluctuations thus determined provide a useful scale with which to measure the variations of student enrollment.[7]

This analysis of the degree of fluctuation produced the following results. (1) Enrollments in the faculties of Protestant theology were by far the most subject to cyclical fluctuations. (2) The structure of the faculties of Catholic theology deviated considerably from that of all other faculties, which leads one to assume that recruitment patterns of Catholic clergymen depended on rather atypical circumstances. Although enrollment varied considerably at all German universities, it fluctuated over stretches of time that are noticeably longer than for other faculties. (3) Cyclical fluctuations were considerably weaker for the faculties of law, both under relatively stable enrollment conditions (until 1860) and in conditions of growth (1860–1930). (4) The faculties of medicine were subject to only modest fluctuations until the great expansion after the middle of the 1870s. At that point, the effects increased in intensity. (5) A similar sequence characterized the faculties of philosophy: During the 19th century, especially the last third, cyclical variations grew in intensity and approached the pattern of the faculties of Protestant theology.

These results suggest the hypothesis that differences in enrollment fluctuations bear a close functional relationship to the social recruitment base of a career. This thesis is based on the following considerations: The social drive toward an academic career depends on class-specific normative prerequisites and on resources which are unequally distributed across strata. Based on both conditions, the level of demand for academic training is more widespread and more stable among the higher classes than in the middle and lower groups. The more an academic career is open in its recruitment base towards below and reaches into strata which are "weaker" in resources and normative conditions, the more intense is the effect of enrollment fluctuations. This hypothesis suggests the expectation that the cyclical dependence of

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trend determination (sliding averages, linear and polynominal regression curves, exponential trends) were tested. These led in general to results similar to those detailed below.

7. Absolute numbers for the faculties of Prussian universities, on which this analysis is based, are roughly comparable, so that they can be converted to cycle values with little distortion. Differences in fluctuation across time were determined in the following ways: If one divides the fluctuation differences between the nadir and the zenith by the duration of the upswing in semesters, one obtains a quotient which measures the intensity of the upswing. All cyclical fluctuations were ranked according to the degree of their intensity. Secondly, in order to eliminate the peculiarities of individual upswings and declines, an average intensity factor was calculated (as arithmetic mean of all individual intensity factors). Thirdly, all absolute values were added together into a total fluctuation value. This was divided by the sum of all semesters in which growth and decline occurred, resulting in a global intensity factor. The results of these various procedures generally coincided.

student enrollments would correspond to its recruitment bases. Relatively "open" student fields should fluctuate more strongly than relatively exclusive areas.[8]

The fluctuation intensity of enrollments varies according to a series of indicators which lead like probes into specific parts of a complex functional nexus:

If the sons of non-university trained officials and teachers, of farmers, workers, servants and unskilled workers are included in the category of strata remote from education, the proportion of these students in the whole produces a hierarchy of faculties which corresponds, as in the hypothesis, to the cyclical dependence of faculties in the Empire.[9] The widely fluctuating faculties of theology and philosophy were considerably more "open" than the less fluctuating faculties of medicine and law. If students from petit bourgeois backgrounds (artisans and small shopkeepers), whom Prussian statistics separate only after 1905, are included as well, this structural relationship does not change.

If faculties are classified according to their quota of academics (i. e., the proportion of students whose fathers had studied at the university), an analogous hierarchy of faculties emerges. With 38.02% of educated fathers among all students in the Empire in the winter semester of 1886–87 the law faculties were clearly at the top. At the bottom were the philosophers with 22.17% and the Catholic theologians with only 3.75%, which once again underlines the special position of the latter. Two factors determine the middle position shared by the more open faculty of Protestant theology and the more exclusive medical faculty: Whereas the high degree of self-recruitment raised the quota of academics among Protestant clergy, the high proportion of students from the propertied bourgeoisie lowered the academic quota for medical doctors.

If one tests this indicator for individual institutions, a social hierarchy of universities can be established, led by the exclusive universities of Marburg (34.20%) and Göttingen (31.36%). The "poor" and "open" universities of Königsberg (20.25%) and Breslau (18.89%) were clearly at the bottom. The as yet incomplete university in Münster held a completely atypical position (quota of academics 8.19%) because of its open faculties (Catholic theology and philosophy).

If one classifies specific faculties on the level of individual institutions according to their quota of academics, a complex hierarchical structure emerges, ranging from the most exclusive faculties at the most exclusive institutions, to the most open faculties at the most open institutions. The law faculty at Göttingen, with 51.80%, held the

8. For the source of this hypothesis, see H.-G. Herrlitz and H. Titze, "Überfüllung als bildungspolitische Strategie. Zur administrativen Steuerung der Lehrerarbeitslosigkeit in Preußen 1870–1914," *Die Deutsche Schule,* 68 (1976), 363 ff. Because of the great institutional differences, the present analysis was based on the data set for Prussian students (1886/7—1911/12).

9. The social classification of students according to father's profession creates considerable definitional difficulties. The Göttingen group followed a pragmatic concept which largely concurs with the scheme developed by K. H. Jarausch, "Frequenz und Struktur. Zur Sozialgeschichte der Studenten im Kaiserreich," *Bildungspolitik in Preußen zur Zeit des Kaiserreichs,* P. Baumgart, ed. (Stuttgart, 1980), 135. It is impossible to separate the sons of peasants from those of estate owners since the Prussian Statistics apparently manipulated primary data in this area.

top position, while the faculty of Catholic theology in Breslau, with 0.95%, brought up the rear. Selection processes of faculties and universities apparently potentiated each other. For example, the highest ranking medical faculties which overlapped with the law faculties were those at the highest ranking universities of Göttingen and Marburg. The philosophical faculty which ranked highest was that of the exclusive university of Marburg. An astounding logic of system building and distribution of "social opportunities" was at work here (Table 1). Therefore, the effects of the functional relationship between "social openness" and cyclical dependence were most apparent where the selection processes, which resulted from the hierarchical structure of faculties and universities, were cumulative (such as in theology in Königsberg and Breslau between 1830 and 1912).

The functional connection between enrollment fluctuations and student structure appears yet more complex if one considers the provincial quota, i. e., the proportion of students originating in the province in which the university is located. This indicator reveals the social-structural space from which an individual university draws its students. The "poor" eastern universities had by far the highest provincial quota: More than nine out of ten students at the Königsberg university came from the home province of East and West Prussia (92.3%).[10] Seven out of ten students in Breslau originated in Silesia. By contrast, the provincial quotas of the more exclusive Prussian universities were clearly lower: Göttingen 67.6%, Marburg 45.5%. Because of its supraregional significance, the mass university in the capital Berlin had the fewest provincial students (31.4%).

A further indicator is the quota of those students in each faculty who changed universities. Since moving from one university to another naturally involved considerable expenses, differential inter-university mobility allows one to speculate about the extent to which students did or did not have additional resources at their disposal. This indicator generally confirms the hierarchy of faculties. The quota of transfers was greatest among law students (between 68% and 75% during 1886–1912). Next came medical students (53% to 67%) and Protestant theologians (54% to 64%) who ranked remarkably high according to this indicator. Changes of university were fewer for students in the philosophical faculty (40% until 1900, then increasing as in other faculties from 43% to just under 58%). Catholic theologians deviated noticeably from the general pattern: only every fifth to eighth student changed universities (13% to 20%).[11]

All of the specific indicators employed in the analysis point in the same direction and support the general hypothesis: A functional relationship existed between enrollment fluctuations in different faculties or fields and their recruitment base; relatively open careers were more affected by oversupply and deficit crises than relatively exclusive ones.

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10. Even during the growth phase in the Empire "the character of the student body ... remained closely tied to the land." G. Selle, *Geschichte der Albertus-Universität zu Königsberg in Preußen* (Königsberg, 1944), 325.
11. The hierarchy of faculties becomes even more pronounced in the quota of those who transfer two or more times.

Table 1: A Social Typology of Universities and Faculties
(Prussia 1887/88)

Faculties		Universities	"Open"	Hierarchy of Universities		"Closed"
			"KÖNIGSBERG	BRESLAU . . .	GÖTTINGEN"	MARBURG
		Quota of academics at all Prussian faculties	20.25	18.89	31.36	34.20
"Open"	Cath. Theol.	3.75	-	0.95	-	-
Hierarchy of Faculties	Phil. Fac.	22.17	11.95	18.35	24.79	31.95
	Prot. Theol.	26.12	17.06	18.96	25.57	29.85
"Exclusive"	Medicine	23.27	22.97	19.95	34.88	33.61
	Law	38.02	34.66	32.72	51.80	49.12
		Provincial Quota of Universities	92.3	79.9	67.6	45.5

An analysis of the cyclical rise and fall of different student streams suggests the following reconstruction of the genesis of the general oversupply crisis for the years 1880–1900 (Table 2):

From the late 1870s to the early 1880s law careers appeared "overcrowded." The proportion of gymnasium graduates which decided to study law greatly decreased (by almost 40%) after 1876. A considerable part of the "deflected" beginners, which might have studied law under more favorable circumstances, turned to the medical faculty, which grew after 1876. A presumably smaller number added to increasing enrollments in the philosophical and theological faculties.

The philosophical faculty which had been expanding since the beginning of the 1870s because of a large teacher deficit was the second large professional faculty to reverse itself. In 1882–3 signs of an overcrowding in secondary teaching multiplied. Enrollments decreased among first-semester students preparing for teaching careers especially sharply in the early 1880s. Whereas every fourth gymnasium graduate turned to the philosophical faculty at the end of the 1870s, by the end of the 1880s only every tenth did so. Those gymnasium graduates increasingly frightened away from teaching careers due to official warnings in the schools turned to the two other faculties which prepared for careers not yet affected by the "oversupply", if they did not abandon university study altogether. Professional prospects in theology seemed especially promising because of the continuing deficit of clergy in both confessions. Therefore the share of gymnasium graduates in the theological faculties increased rapidly (from 25.8% in 1882–3 to 34.2% in 1887–8). The influx into medicine also grew until 1885–6, even if more modestly.

About four years later the two remaining major academic careers also appeared closed and the faculties of medicine and Protestant theology entered a phase of decline. Except for the Catholic clergy, atypical because of its special recruitment pattern, all four academic professions for which university faculties prepared seemed "overcrowded" at the end of the 1880s. In public perception and discussion, as well as in administrative measures, the years 1889 and 1890 marked the height of the oversupply crisis in the Wilhelmian era.

This analytical reconstruction based on enrollment cycles of faculties essentially corresponds to the actual oversupply situation.[12] There is something to the thesis that student enrollments in specific fields anticipated the reversal of professional prospects by several years. Even before the overcrowding of a career actually became apparent, the influx of beginning students decreased. First-semester enrollments offer sensitive indicators in so far as they registered "seismographically" the approach of oversupply waves.

The selection processes which underpin the cyclical enrollment fluctuations are interesting. A whole series of reasons indicates that in unfavorable objective conditions, such as during overcrowding, candidates from middle and lower classes abandoned their academic aspirations and became discouraged more readily than those from the upper classes. A second less obvious observation, which relates to a hidden,

12. See the contemporary literature cited in D. K. Müller, *Sozialstruktur und Schulsystem* (Göttingen, 1977), 274ff.

Table 2: Long Cycles of Student Enrollments at Prussian Universities

Faculty/ University	Number	Period Upswing	Downswing		Duration of the cycles in: Semesters			Years
		2	3	4	5	6	7	8
Prot. Theol.	1	1772	- 1782	- 1805/06	20	47	67	33.5
Göttingen	2	1805/06	- 1828/29	- 1852	46	47	93	46.5
	3	1852	- 1860	- 1876/77	16	33	49	24.5
	4	1876/77	- 1888	- 1902/03	23	29	52	26
	5	1902/03	- 1919	- 1925/26	33	13	46	23
Prot. Theol.								
All	3	1852/53	- 1861/62	- 1876/77	18	30	48	24
Prussian	4	1876/77	- 1887	- 1905/06	21	37	58	29
Universities	5	1905/06	- 1913/14	- 1925	16	23	39	19.5
Cath. Theol.								
All		1839	- 1859/60	- 1880/81	41	42	83	41.5
Prussian Universities		1880/81	- 1919	- 1925/26	77	13	90	45
Law	3	1843	- 1851/52	- 1860	17	17	34	17
All	4	1860	- 1878/79	- 1886	37	15	52	26
Prussian Universities	5	1886	- 1906/07	- 1915	41	17	58	29
Medicine		1848	- 1871/72	- 1875/76	47	8	55	27.5
All		1875/76	- 1887	- 1904/05	23	35	58	29
Prussian Universities		1904/05	- 1919	- 1925	29	12	41	20.5
Phil. Fac./	2	1835	- 1845/46	- 1854	21	17	38	19
Philology	3	1854	- 1869/70	- 1873	31	7	38	19
All	4	1873	- 1882/83	- 1893	19	21	40	20
Prussian Universities	5	1893	- 1912/13	- 1924	39	24	63	31.5

rarely described mechanism, complements the first: When conditions were favorable, as during academic demand, candidates from middle and lower classes would try to seize their opportunities by aiming in greater numbers for those professions which offered especially promising prospects and a relatively quick remuneration. Both observations lead to the hypothesis of the double selectivity of the "academic job market."

During oversupply crises, a negative selection was at work which was stronger, the lower the social origin of the student (deterrent effect). During contraction phases of enrollments, the proportion of students from the upper classes increased (displacement effect). During deficit crises, a positive selection process came into play, whose effect was stronger, the lower the social origin of the gymnasium graduate. In expansion phases, the proportion of students from lower classes increased (attraction effect).

If the hypothesis of double selectivity is correct, the social recruitment of academic careers must adjust "upwards" or "downwards" in the short run while remaining fairly stable in its prevailing characteristics in the long run. Cyclical changes in the recruitment base of Prussian students at Prussian universities were examined between 1886–7 and 1911–2. All faculties showed specific deterrent and displacement processes during oversupply phases and attraction effects during deficit phases.

During overcrowding in the Protestant clergy, the proportion of sons of officials of all categories (including sons of pastors) grew considerably (from 55% to 72%) whereas the sons of farmers and small businessmen, especially artisans and small shopkeepers, were "displaced" (contracting from 39% to 20%).

The number of graduates destined for the priesthood, the only major academic career that was not overcrowded in the critical decades, quadrupled in the 1880s and 1890s. This influx was composed above all of sons of farmers, artisans, small merchants, skilled and unskilled workers. Whereas the sons of the proletariat were a rare exception among students in the two exclusive faculties (most semesters far less than 1%) and in the two open faculties (in Protestant theology and philosophy, rising to about 1–2%), in Catholic theology their proportion climbed from 2–4% at the end of the 1880s to not less than 12% before the First World War.

During the downcycle of law enrollment, the sons of higher state officials reached their highest proportion among law students (over 26%). During the expansion before World War One their proportion decreased to under 19%.

Worsening prospects in medicine largely benefitted the sons of free professionals: they almost doubled their numbers (from 7% to 13%) among the decreasing numbers of medical graduates.

At the height of the oversupply crisis in secondary teaching sons of higher officials made up almost 20% of the first major field of study in the philosophical faculty (ancient and modern philology and history). In the deficit phase preceding World War One their proportion was halved to 10 percent. Sons of middle and lower officials showed an opposite tendency; their proportion declined to under 25% during the oversupply phase but climbed to 40% during the deficit phase before World War One. Trends in the mathematical-natural science field were similar, occasionally even more pronounced.

This empirical material therefore supports the above deterrent, displacement and attraction hypothesis. Since the recurrent worsening of professional prospects only

affected all careers simultaneously during general oversupply crises, the narrowing of opportunities in one area usually coincided with "still favorable" prospects or once again broadening opportunities in other areas. The diverse deterrent, displacement and attraction mechanisms which kept the system of academic reproduction in a state of equilibrium must therefore be considered as partial aspects of a single functional process.

Whereas the preceding examination of cyclical recruitment changes was based on an inflow analysis (where do the students of the different faculties come from?) the following outflow analysis reverses the perspective: Where do the students from different social groups go?

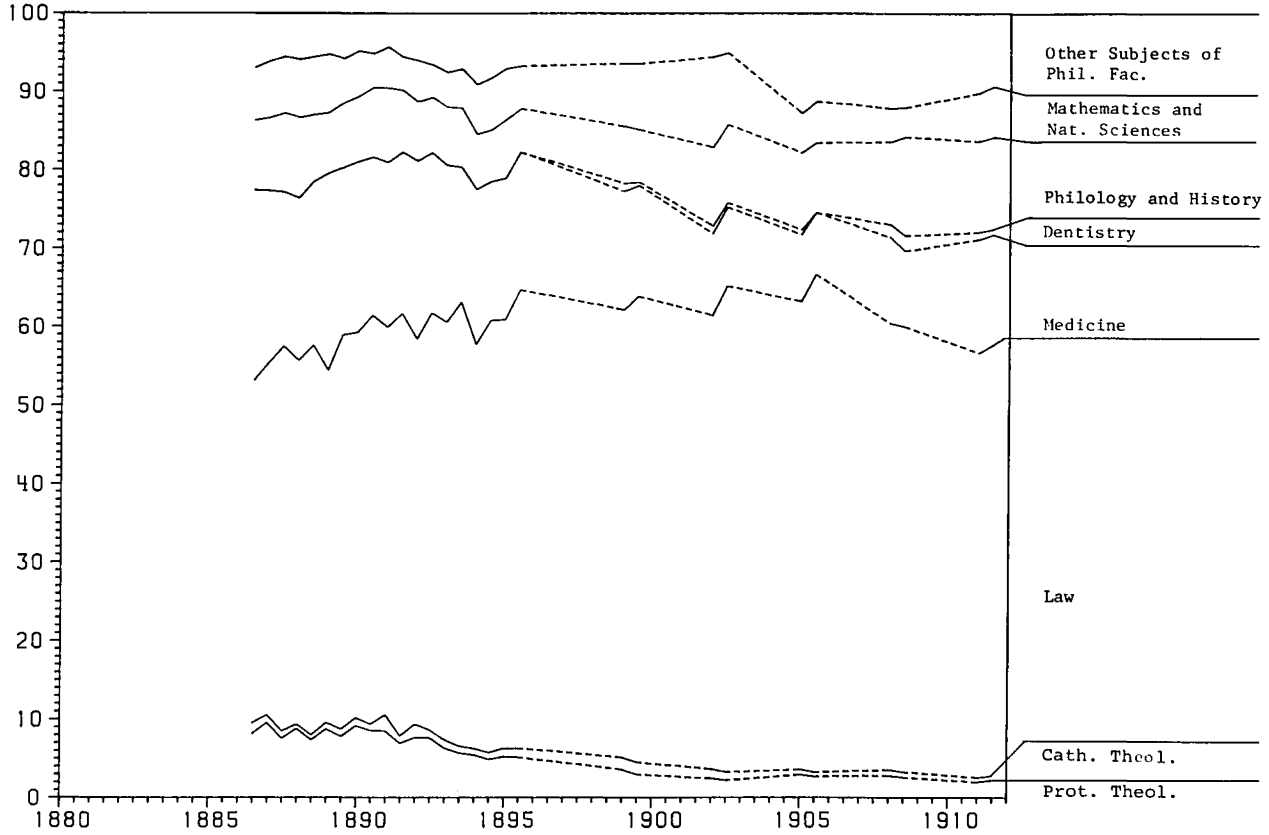
If it is true that beginning students selected their subject of study according to relative perceptions of career prospects depending on their social origins, this pattern should hold for students of all semesters from one stratum. Career preferences of one social group can be depicted as a profile of fields which illustrates the proportion of which students choose different faculties. If study choices of one social group were relatively independent of changes of supply or demand in different careers, a relatively stable field profile should emerge for this social group. If students from a certain stratum often chose their field of study according to changing professional prospects, an unstable field profile should result.

A social analysis of study choices impressively confirms the hypothesis that students from the middle and lower strata responded more to professional oversupply and deficit cycles than did students from the upper classes. Sons of higher officials and lawyers showed quite a stable profile of study preferences (Graph 1). Between two-thirds and three-fourths chose legal and medical studies from 1886 to 1912. A certain interdependence between law and medicine was apparent within the relative stability of these exclusive careers. Not influenced by changing professional prospects, enrollments in teacher preparatory courses maintained a lower but stable level. Spiritual callings in the Protestant and Catholic church appeared less and less attractive; the two theological faculties declined into insignificance as choices by World War One. Study preferences of sons of officers and estate owners had a similarly stable profile (with law even more dominant). Sons of doctors tended to prefer the two exclusive careers, with a naturally large proportion in the medical faculty because of self-recruitment.

Study choices of sons of clergymen and secondary school teachers were more influenced by changing career prospects. With the worsening of opportunities for Protestant clergymen (and a more favorable outlook for alternate careers) the traditionally high quota of self-recruitment of pastors decreased more drastically than in any other career (from 60.9% to 30.7%). The crucial development was the shift in relationship between the Protestant theological and the philosophical faculties. At the height of the overcrowding crisis in secondary teaching around 1890 only every tenth pastor's son was enrolled in the philosophical faculty; during the phase of favorable prospects and great expansion among secondary teachers around 1908, there were proportionately three times as many. When signs of renewed overcrowding in secondary teaching appeared shortly before the First World War, their proportion in the philosophical faculty again declined slightly.

The profile of study choices of the sons of secondary school teachers was similarly influenced by cycles. The comparatively low level of self-recruitment, fluctuating be-

Graph 1: Study Profile of Sons of Higher Officials and Lawyers
(Prussia 1886–1912)



tween 25% and 43%, corresponded closely to cyclical oversupply and deficit phases. Aside from this professional orientation, the son's study profile reflected the father's professional fate; a very high proportion aimed for a legal career. For decades during the Empire the fathers struggled for status equality with jurists, finally achieving financial parity with the lowest level of judges in 1909.[13] Around the turn of the century, a few years after renewed discrimination against teachers in the salary reform of 1897, sons of secondary school teachers chose law even more often than their father's career.

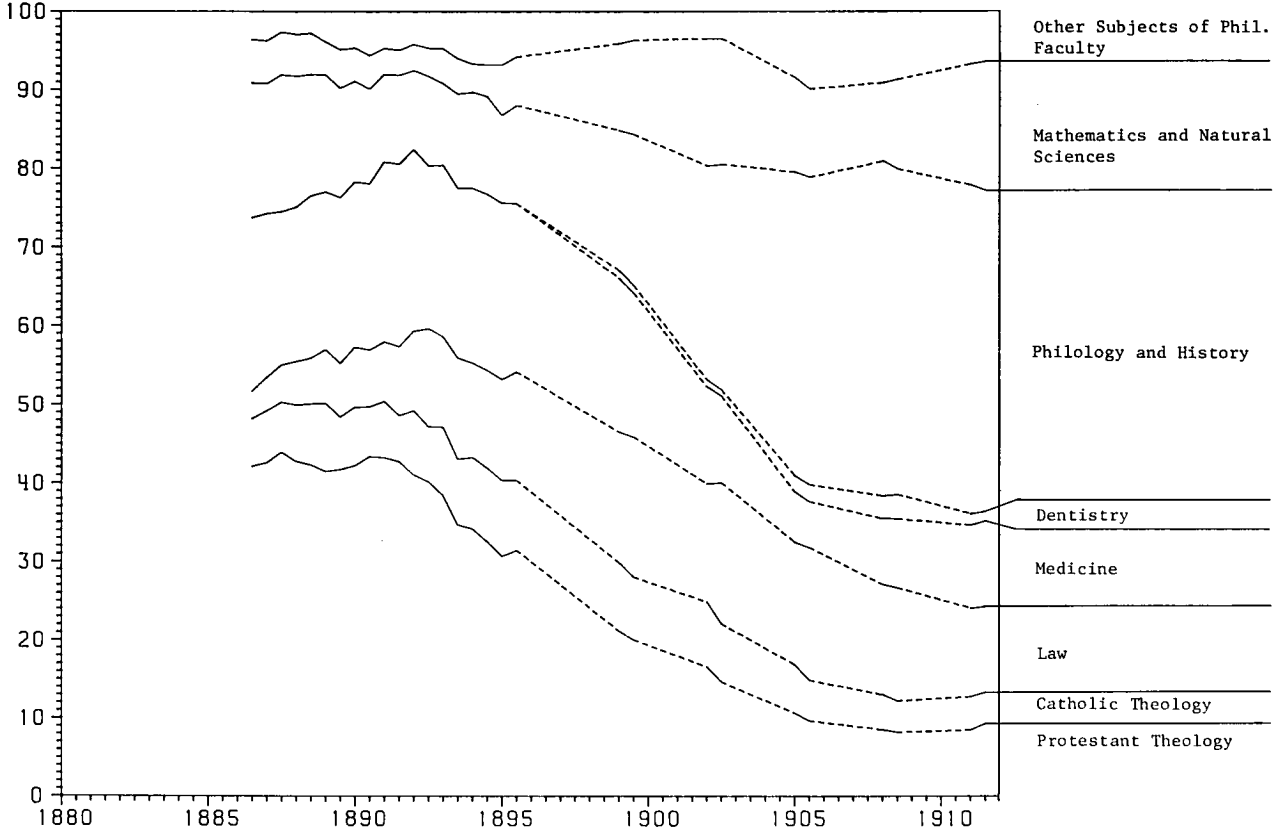
Changing professional prospects exerted their strongest influence on the study preferences of the sons of the new middle class of the growing public sector. For the majority of these students from middle and lower official and elementary school teacher families university study entailed considerable financial sacrifice and depended upon rapid employment after the examination. It is not surprising that a relatively strong concentration in the open faculties as well as a cyclical demand orientation characterized the profile of this group. While only 13% of sons of elementary school teachers were enrolled in the two major teacher preparatory courses at the height of the oversupply crisis in philosophy, this proportion rose rapidly with the improvement in career prospects and reached no less than 57% in 1911–12. As a countertrend, the proportion of those entering the overcrowded career of Protestant theology shrank from over 40% to under 10% (Graph 2). This unstable profile of study preferences of elementary school teachers' sons resembled the pattern of middle and lower officials, with two characteristic differences: Their proportions were lower in both theological faculties, yet higher in law, while the cyclical dependence of their preferences of fields of study was somewhat less pronounced.

If the double selectivity hypothesis is correct, its social mechanisms should manifest themselves in changes of study field. In decline phases the proportion of those students who abandoned their originally chosen field and turned to another with better career prospects increased (deterrent effect). Those who changed fields of study oriented themselves according to perceived professional prospects and turned to those faculties or subjects which promised especially favorable opportunities (attraction effect).

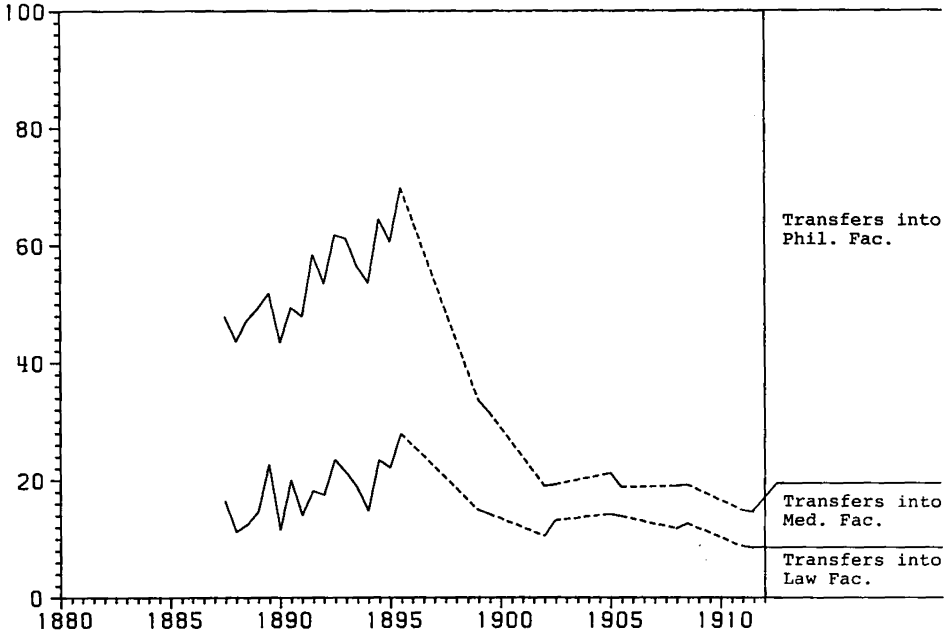
Because of the available data, these hypotheses can be tested only for Prussian students in general, not according to their social origin. The sources limit verification to the two faculties that cyclically declined during the period investigated: Protestant theology (1887–1905/6) and medicine (1887–1904/5). The deterrent hypothesis was confirmed in both instances. The proportion of those who left the faculty of Protestant theology increased from 7.42% in the winter semester 1887–8 to 16.14% in the winter semester 1899–1900. The proportion of students departing from the medical faculty also rose considerably and even tripled in the decline phase from 2.86% to 8.72%. As a complement to the growing number of those who removed themselves from the two overcrowded careers, the number of those who left the faculty of philosophy in the deficit phase decreased accordingly from 11.45% in 1893 to 5.54% in 1911.

13. H. Titze, "Die soziale und geistige Umbildung des preußischen Oberlehrerstandes von 1870 bis 1914," *Zeitschrift für Pädagogik, Beiheft* 14 (1977), 107–128.

Graph 2: Study Profile of Sons of Non-Academic Teachers
(Prussia 1886–1912)



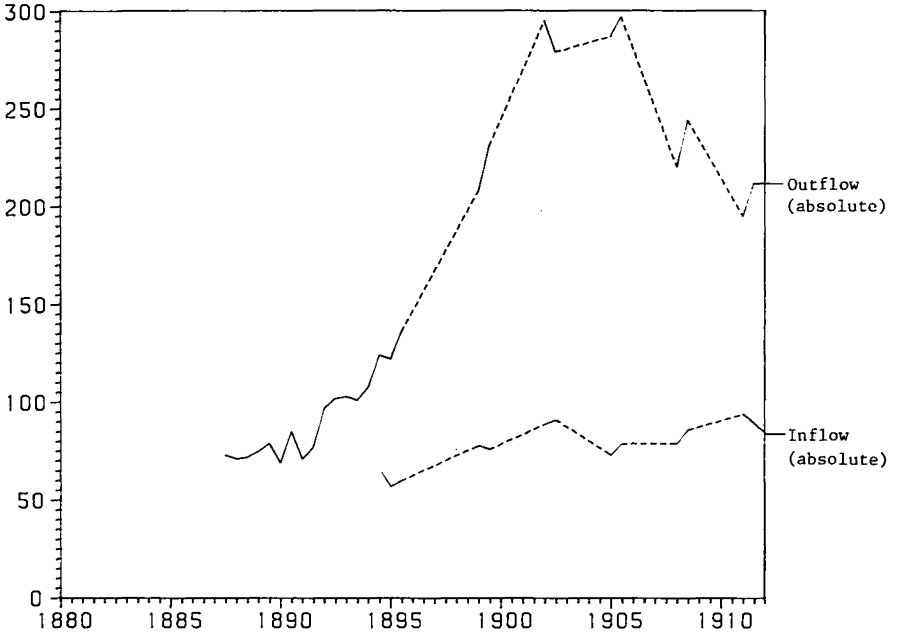
Graph 3: Profile of Transfers out of Catholic Theology Faculties at Prussian Universities



The attraction hypothesis of deficit phases was confirmed even more convincingly. A central, overriding tendency determined the changes of major fields: the growing stream of those who left other faculties in order to enter philosophy. The deficit of secondary school teachers, repeatedly predicted in the scholarly world from the mid-1890s, created an enormous attraction, not only among beginning students but also among those who changed fields of study. This effect can be clearly seen in the structure of the profile of those who left their original faculties. The proportion of transfers into philosophy increased in Protestant theology from 34.21% in 1892 to 84.10% in 1905, in Catholic theology from 34.49% in 1895 to 80.83% in 1902, in law from 23.75% in 1888 to 67.77% in 1905, and in medicine from 32.77% in 1888 to 66.07% in 1905.[14]

14. R. Bünger, "Der Bedarf Preußens an Abiturienten," *Preußische Jahrbücher,* 73 (1893), 52-84; A. Schoenfliess, "Die Überfüllung im höheren Lehrfach. Bemerkungen zu der Lexis'schen Denkschrift," *Preußische Jahrbücher,* 69 (1892), 192-206; E. Huckert, "Zur Statistik über den Bedarf an Lehrkräften an den höheren Schulen Preußens," *Blätter für höheres Schulwesen,* 13 (1896), 86-88, 104-105.

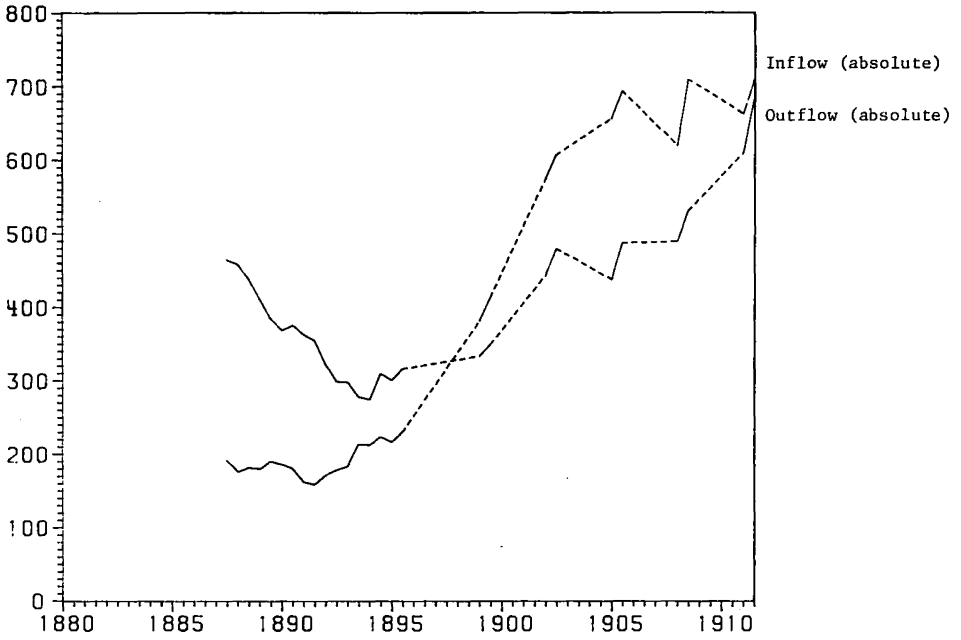
Graph 4: Profile of Inflow and Outflow at Catholic Theology Faculties



Additional specific results also fit the framework of the hypothesis. The proportion of those who left the theological faculties was considerably higher than those who transferred from the exclusive faculties of law and medicine. Therefore both theological faculties reflected the change of teaching prospects more graphically. At the end of the 1880s and the beginning of the 1890s, the transfer quota decreased due to an intensification of the oversupply crisis in secondary teaching, only to increase again after the first predictions of a future deficit (Graph 3). The Catholic theological profile reveals the extent to which the pull of teacher demand created a loss since more students left than entered (Graph 4). By 1900 the Prussian priesthood deficit of 1100 vacant posts had disappeared, and a considerable number of those theological students switched to the more attractive "deficit career" of secondary school teaching. The change in teaching prospects is also evident in the profile of the philosophical faculty. Because of the long waiting periods for candidates for teaching positions, the philosophical faculties exhibited a large transfer loss during the overcrowding phase in teaching. The subsequent teacher deficit reversed the pattern and they registered a gain in transfers until the renewed oversupply warnings shortly before the First

World War (Graph 5).[15] The relatively high quota of changers (those who enter as well as those who leave) in the philosophical faculty confirmed the wellknown phenomenon that many of the candidates were motivated by other factors and saw school teaching only as a "poor second" career.

Graph 5: Profile of Inflow and Outflow at Philosophical Faculties



The analysis of those who change fields of study complements and confirms the results of the examination of the different recruitment bases of the faculties. In comparison to the others, transfers between the two exclusive faculties (law and medicine) were relatively frequent. Both exhibited a greater "social distance" from the theological faculties, whereas the high level of exchange of the latter with the philosophical faculty once again indicated the "social proximity" of the two open faculties. Obviously, educational prerequisites, such as knowledge of classical languages,

15. W. Lexis, "Bedarf und Angebot in den gelehrten Berufszweigen," *Hochschul-Nachrichten,* 15 (1905), 6; E. Huckert, "Steht ein Überfluß an Philologen bevor?" *Blätter für höheres Schulwesen,* 27 (1910), 278-281.

also played a role. The behavior of transfers into and out of the medical faculties also reinforced these results. During the overcrowding of physicians the number of those who changed into the medical faculty declined steadily until 1905. While theology students transferred only rarely during this critical phase, law students still entered more frequently despite unfavorable prospects in the medical profession.

Growth Dynamics in Academic Careers:

The rapid expansion of academic careers in the Empire raises the question of long-range growth conditions in the tertiary educational sector.[16]. The initial analysis of long-term student enrollments for old Prussian universities since 1820 and for some individual institutions even earlier (Göttingen after 1767), suggests new hypotheses which must be refined through further research.

The largest academic professions grew remarkably little in the middle third of the century (Table 3). The growth pause of the prerevolutionary period manifested itself in the long-term trend of the further education of gymnasium graduates. Their numbers grew to over 15,200 in the 1820s. This boom was the prerequisite for the pre-1848 overcrowding of academic careers. As in the preceding excess in the last decades of the 18th century, admission prerequisites for academic studies and careers in higher civil and clerical service were restricted socially. As a consequence of this restrictive policy and of the overcrowding itself, the total number of secondary school graduates entitled to study decreased in the 1830s to 13,500 and in the 1840s to under 12,000. After these two decades of contraction and restriction, the level of the 1820s was reached and exceeded once again in the 1850s.[17]

The focus of the recent debate on the spectacular oversupply crisis of the 1880s and 1890s has obscured an equally remarkable phenomenon: From the beginning of the 1870s, academic careers faced partly serious shortages. There is much evidence that the general deficit was a delayed effect of the restrictive entitlement policy maintained since the 1830s, which had kept the influx into the professions down "corresponding to need." Bureaucratic regulation in the prerevolutionary period was compatible with restrictive planning and control of "educated manpower demands." Long-term, unintended effects caught up with this policy in the 1860s and 1870s.

16. Demographic influences certainly played no role during the Empire. By comparison, they were of great importance in the enrollment collapse in the Third Reich. Declining birth rates from 1915 on (which made themselves felt among graduates and students after the mid-1930s), along with the deterrent effects of the oversupply crisis and extreme political measures must be taken into account in order to avoid a false interpretation of the dramatic contraction of university attendance under National Socialism.
A small part of the growth in student numbers in the Empire can be attributed to a prolongation of time of study. Since female students played a role only in the last five years before World War One, they have been excluded from this essay. But this new factor contributed to the overcrowding phase of academic professions between the wars.

17. L. Wiese, ed., *Das höhere Schulwesen in Preußen* (Berlin, 1864), 1: 512ff.; H.-G. Herrlitz, *Studium als Standesprivileg* (Frankfurt, 1973); see also Schubert, "Zur Geschichte und Statistik der akademischen Studien und gelehrten Berufe in Preußen seit 1840," *Archiv für Landeskunde der Preußischen Monarchie,* 2 (1856) 188–204.

Table 3: Growth of Academic Professions in Prussia (1815–1930)

Positions for Prot. Clergy			Legal Positions in Government Service			Doctors			Secondary School Teachers			
Year	Old Prussia	New Prussia	Year	Old Prussia	New Prussia	Year	Old Prussia	New Prussia	Year	Old Prussia (incl. probationers)	New Prussia (incl. probationers)	New Prussia (only regular appointments)
1815	5,584		1830/35	5,911		1825	4,084		1816	976		
1840	5,791		1836/40	5,915		1849	5,558		1832	1,263		
1850	5,921		1851	5,897		1852	6,352		1846	1,655		
1860	6,187		1855	6,307		1861	6,023		1851/52	1,933		
1870	6,448		1860	6,864		1867	5,692	7,420	1863	2,614		
1880	6,608		1866	7,200		1876	6,134	7,956	1868	3,127	3,805	
1890		9,343	1875	7,100		1879	6,425	8,271	1870/71		4,215	3,675
1900		10,071	1881	7,020	8,500	1882	6,609	8,436	1880/81		5,533	4,960
1910		10,743	1889		9,888	1887	7,307	9,284	1890/91		6,802	5,617
1918	7,656	10,332	1902		12,560	1898	12,041	14,906	1900/01		7,126	6,724
1925	7,267	9,890				1901	13,597	17,034	1910/11		10,500	9,546
1930	7,500	10,232				1910		19,671	1913/14		11,189	10,167
						1914		20,632	1921/22		15,138	12,680
						1920		19,917	1925/26		15,401	12,050
						1925		26,485	1930/31		17,041	15,403
						1930		29,579				

Dentists are not included among doctors. Until 1851/2 teachers include only those at gymnasia, after 1863 the "scholarly" teachers at all recognized secondary schools, from 1921 on, also those at girls' schools.

Since the shortages affected almost all careers, they were not the results of a natural, false distribution of students; rather they were the consequence of a general deficit of gymnasium graduates.

In the first half of the 1870s, the number of students in Protestant theological faculties was at least one-third below replacement need, in the second half still one-fourth below. There were lively discussions "about the decline in the study of theology" at numerous church conferences in the 1870s. The situation for priests (aggravated by the *Kulturkampf*) was so precarious in the second half of the 1870s that Prussian students of Catholic theology did not make up even one-fourth of the replacement need. "The number of students is so insufficient" noted J. Conrad "that the clergy will shortly almost become extinct and most posts remain vacant if a change for the better does not occur soon."[18]

Between 1866 and 1875 legal positions also showed a considerable shortage. In comparison to the clergy, the deficit was less apparent since law could draw upon the "stock" of employable candidates who had completed their training in the first half of the 1860s. Those who did not listen to the warnings of the Ministries of Education and Justice in 1857–8 and were not frightened away, could expect favorable career prospects upon completion of their education.

In the revision of his *Denkschrift* W. Lexis gradually moved away from the oversupply thesis for doctors. There could be no talk of a general overcrowding of the medical profession even in 1890 since too few doctors had been trained by the beginning of the 1880s and the deficit had to be made up first. In 1884 Conrad concluded from his investigation of medical demand that there was more reason to complain of a lack of doctors in the present than in the pre-revolutionary period.[19]

The shortage of teachers in secondary schools was especially serious in the 1870s. Until 1881 the demand could only be filled through the employment of candidates who had not yet passed their examination, without even requiring official permission from the ministry. Because of numerous teaching vacancies, the examination regulation of December 12, 1866 opened the higher grades of secondary schools even to those who held a third degree diploma, i. e., were qualified only for the lower forms of the gymnasium. Seen in this context, the opening of the teaching career to graduates of the *Realgymnasium* was less a concession to bourgeois demand for modern education than a result of pressures to compensate for the deficit of gymnasium graduates.

In the political climate of the oversupply hysteria of the 1880s and 1890s it was naturally difficult for the few contemporaries not influenced by self-interest to make their sober analyses heard. Independent experts such as Huckert and Bünger, who critically examined the succession of oversupply and deficit, were an exception. They were faced with hostility on all sides because of "impairment of professional interests." Given the social explosiveness of the problem it is not surprising that the defi-

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18. Conrad, *Das Universitätsstudium*, 77; Schlosser, *Abnahme der Theologie;* L. Ernesti, *Über die Abnahme der Theologie-Studierenden* (Stuttgart, 1875); Conrad, *Das Universitätsstudium*, 96; W. Lexis, *Denkschrift über die dem Bedarf Preußens entsprechende Normalzahl der Studirenden der verschiedenen Fakultäten* (Berlin, 1891), 21.
19. H. Hälschner, *Das juristische Studium in Preußen* (Bonn, 1859); Lexis, *Denkschrift;* Hoffmann, *Sammlung*, 210ff.; Conrad, *Das Universitätsstudium*, 126.

cit was far less frequently discussed in public than the supposed or actual oversupply.[20]

The shortages of academics aggravated by a decline in willingness to study between 1861 and 1874 probably related to increasing economic prosperity. Insufficient numbers of gymnasium graduates and a deficit of professionals led to pressure for modernization of secondary schools and universities in the 1860s and 1870s. Expansion of the educational system itself became the most pressing problem. The enormous broadening of educational opportunities through expanding existing secondary schools and establishing new ones can be seen as a response to this problem. The growth of the philosophical faculties from 24.12% to 46.72% of the student body between 1854 and 1880 further confirms the internal growth of the educational system (in 1880 41,84% of all students were enrolled in fields leading to teaching careers, Graph 6).

In the expansion phase, the educational system itself absorbed the majority of its graduates in order to meet its own needs for new teachers. Only after the growth of this lead sector could the other professions enter into rapid increases as well. This functional relationship renders the temporal sequence of growth waves in various academic careers analytically transparent. The expansion of secondary teaching directly preceded the increases in the major traditional careers (lawyers, doctors, to a lesser extent clergymen) which occured mostly in the 1890s. More than twice as many exams for secondary teaching were passed between 1860 and 1869 *(pro facultate docendi)* than in the preceding decade: 2,240 compared to 1,066. There was a further rise of 77% in the 1870s (3,967 examinations 1870–1879). The growth in teacher examinations (Graph 7) led to a rapid increase in regular teaching personnel in secondary schools in the 1870s. The expansion of the educational system itself was also reflected in the growth of teaching staff at universities.

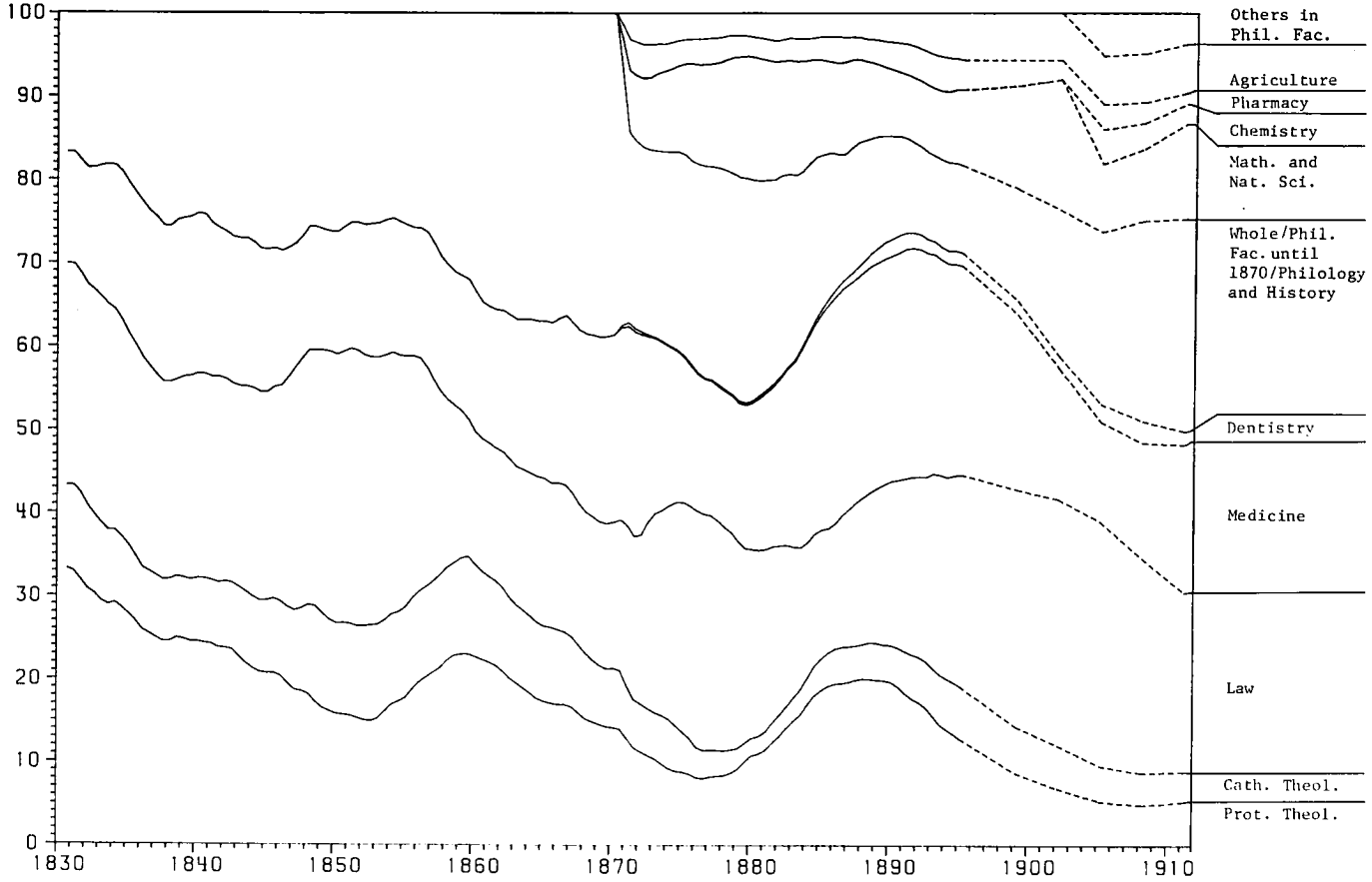
A deficit of professionals together with favorable economic and political conditions for the rapid expansion of secondary education were the most important prerequisites for the extraordinary educational growth until the early 1880s. From the mid-1870s this expansion was reinforced by the "great depression" in the economy. Given business uncertainty, higher civil service appointments became especially attractive and the deficits in this area were eliminated by the early 1880s. Shortages in the free profession of medicine and in the Protestant clergy were overcome at the end of the 1880s. These careers were "overcrowded" only in the 1890s.[21]

With the expansion of the educational system itself, the "natural" recurrence of academic overcrowding appeared on a new level, i. e., under growth conditions. This novel, complex and scarcely controllable growth increasingly disturbed the Prussian bureaucracy, especially at a time when the working class was beginning to organize. In connection with the reactionary reorientation of all domestic politics, educational policies were also redirected towards a conservative course in the early 1880s. Fur-

20. Decree, June 15, 1881, *Centralblatt für die gesammte Unterrichtsverwaltung,* 1881, 536; Titze, "Soziale und geistige Umbildung," 116ff.; E. Huckert, "Der Mangel an Lehrkräften für die höheren Lehranstalten," *Preußische Jahrbücher,* 130 (1907), 68.

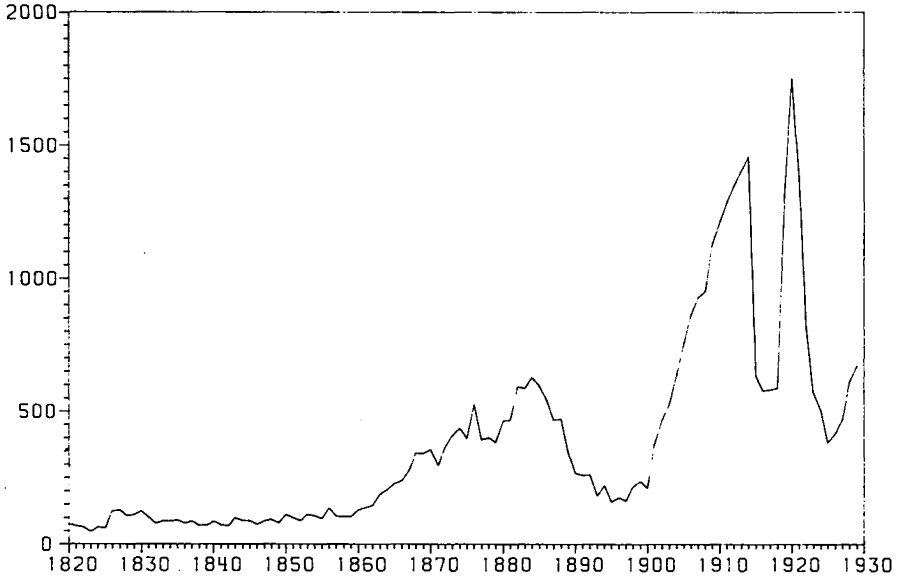
21. Herrlitz/Titze, "Überfüllung als bildungspolitische Strategie," 368; P. Lundgreen, "Das Bildungsverhalten höherer Schüler während der akademischen Überfüllungskrise der 1880er und 1890er Jahre in Preußen," *Zeitschrift für Pädagogik* (1981).

Graph 6: Faculty Profile of Students at All Prussian Universities (1830–1912)



ther expansion was checked on all levels with numerous subsidiary measures out of fear of the reforming consequences of a continued liberalization and social opening of the educational system.

Graph 7: Successful Examinations for Teaching at Prussian Secondary Schools (1820–1930)



Ruthlessly and capitalistically, the leadership (Bismarck, Minister of Culture Gossler) espoused cutting off social access to academic careers towards below. In order to exclude the poorer strata, the costs of education were systematically raised: higher tuition for secondary education, graduated according to level of entitlement (the more opportunities, the higher the cost); increased study costs at universities (fees for matriculation or exmatriculation, auditorium fees, charges for institutes and laboratories in certain fields, higher examination fees etc.); limitation of postponement of lecture fees (whoever wanted to study had to pay for the lectures in cash); decrease of support through scholarships and free lunches; negative pressure on private foundations etc.; and considerable cutting and freezing of all support. For more than a decade, the Minister of Culture was in the grip of an "overcrowding mentality" which hindered the development of sober policies directed toward long-range modernization. The postponement of the structural adaption of secondary schooling

to the requirements of progressive industrialization (parity for modern education) was largely a result of the "overcrowding problem" and its exaggeration by special interest groups.[22]

The bureaucracy of the 1880s and 1890s arrogantly overestimated its possibilities of control. The attitude around which it organized its efforts to regain control of education was symptomatic of both the strength and weakness of these Prussian officials. They were modern and up to date in their methods. In their normative ends, however, they were too traditional to be successful in the long run. Their intention of not only channeling growing educational aspirations in loyal directions but of limiting them, could no longer prevail against the powerful demand for wider participation in education following the industrial "take-off." Prussian cultural officials had to learn painfully in the two critical decades that all of secondary education had expanded into a complex system since the 1860s which was increasingly escaping their control. As the developments between 1880 and 1900 demonstrate, the further expansion of the education system could be slowed by political counter-measures but, propelled by industrialization, it could no longer be reversed in principle. Despite efforts to discipline and muzzle young academics, the effects of political measures and controls were relatively limited. This is illustrated by the long-range growth trends of teaching personnel in secondary education. While the increase in regular teaching positions in the twelve years between 1870–71 and 1882–3 amounted to a total of 1,437, during the subsequent twelve years it was cut in half to 702 under the influence of restrictive policies. During this phase of slowed growth, classroom teaching could only be maintained by calling upon the large reservoir of teacher-trainees who bore the full brunt of this restrictive policy as "oversupply victims." But their long-range influence was minimal. The twelve "lean" years were followed by a rapid growth phase until World War One, when the shortages which had been suppressed and dammed up by the preceding restrictive policy were made up. From 1899–1900 to 1913–14 permanent teaching staff rapidly increased again and expanded by no less than 3,724 positions in fourteen years. Growth in secondary education, nourished by profound socio-economic, political and cultural changes, could no longer be permanently throttled by traditional political measures. Neither the authoritative decisions of the Imperial Chancellor Bismarck nor the clever strategies of Prussian ministerial bureaucrats could prevent the completion of the historic breakthrough to a new level of educational expansion in the Empire.[23]

Effects of Selection Processes during Career Expansion:

The complex selection mechanism in academic recruitment during the growth phase produced four major results up to World War One.

22. ZStA Merseburg, Rep 92 (Nachlaß Althoff), A I, Nr. 31, 92, 93, 100; Geheimes Zivilkabinett 2.2.1 Nr. 22307-22309; H. Balschun, "Zum schulpolitischen Kampf um die Monopolstellung des humanistischen Gymnasiums in Preußen im letzten Drittel des 19. Jahrhunderts" (diss. Halle, 1964).
23. D. K. Müller, "Qualifikationskrise und Schulreform," *Zeitschrift für Pädagogik*, 14. *Beiheft* (1977), 17 ff.; Titze, "Soziale und geistige Umbildung," 123 ff.; Herrlitz/Titze, "Überfüllung als bildungspolitische Strategie."

First, the great expansion of academic studies in Prussia between 1870 and 1914 was associated with a certain social opening of university studies and their related academic careers towards below. Two strata benefitted above all from the broadening of the recruitment base: sons of the rapidly growing new middle class of public officials and sons of trade and industry. In 1886–7 a total of 951 children of Prussian elementary school teachers were enrolled at Prussian universities, but by 1911–12 there were 2,451. During the same time period, the number of students from middle and lower official families increased from 1,478 to 3,393. Students from this new bureaucratic *Mittelstand* alone composed more than one-third of the absolute enrollment increase at Prussian universities. The second third of the absolute growth was made up of trade and industry (increasing from 4,461 to 7,601). The remaining third of the growth came from various social groups.

Second, in the critical 1880s and 1890s, when the privileged classes (nobles, propertied and educated bourgeoisie) assumed a defensive position in order to curtail the growing status competition of the middle and lower classes for access to academic careers, the petit bourgeois strata of the state bureaucracy were more resistant than the independent and self-employed strata of artisans, small merchants and peasants.

In 1905 the proportion of independent artisans and small merchants in the heterogeneous group of commercial and industrial parents made up about 80%, by 1911–12 only 67%. Within the swollen group of merchants and industrialists, the share of poorer students from small business backgrounds decreased in favor of their more prosperous rivals from the upper middle class. This relative decline in the sons of artisans and small merchants was a consequence of the differentiation of school types which emerged in connection with the general overcrowding crisis of the 1880s and 1890s. Along with the granting of formal parity for the three nine-year complete institutions *(Gymnasium, Realgymnasium, Oberrealschule),* the incomplete schools, with their shorter programs of study (without university access) were greatly expanded. The *Realschule,* without Latin, or the higher *Bürgerschule,* favored by the Prussian educational administration and by various reform groups, was to channel a part of the increased demand for education into an intermediate level of entitlements. This *Realschule* was intended as a social integrator for the commercial and bureaucratic petite bourgeoisie whose desire for education had led to greater social competition for access to academic careers. The special significance of the *Realschule,* promoted as "school of the future for the middle and bureaucratic strata," lay in this double function of simultaneously broadening and limiting educational opportunities.[24]

The as yet only meager data on the social origins of secondary school pupils in the Empire indicates that this deflection strategy, disguised as "support of the *Mittel-*

24. See D. K. Müller et al., "Modellentwicklung zur Analyse von Krisenphasen im Verhältnis von Schulsystem und staatlichem Beschäftigungssystem," *Zeitschrift für Pädagogik, Beiheft*14 (1977), 37–77; Halfmann in W. Lexis, *Die Reform des höheren Schulwesens in Preußen* (Halle, 1902), 361: "It has the significant social task of intellectually elevating the middle class, positioned between the capitalists and the proletariat, and of educating it for an understanding of its contemporary duties." Prussian Ministry of Culture ed., *Verhandlungen über Fragen des höheren Unterrichts. Berlin 4. bis 17. Dezember 1890* (Berlin, 1891), 692.

stand," apparently succeeded at least in part in restricting competition for privileged careers. Between 1876 and 1896, artisans' sons were ever more "displaced" from the full gymnasia and redirected into *Realschulen* with fewer entitlements, which still offered a limited possibility of social advancement but excluded access to the coveted academic careers.

This defensive strategy was less successful in the case of the bureaucratic petite bourgeoisie. Most striking is the persistent striving for education of the sons of non-academic officials and elementary school teachers who were discouraged neither by the oversupply propaganda nor by lengthy unsalaried waiting periods before appointment. The stamina of this strata was itself a product of the dynamism of the public entitlement and career system which was threatening to exclude them. As officials on the middle and lower rungs of this hierarchy, the fathers of this student group had learned in their professional lives what educational qualifications meant for entry into the different ranks and for advancement within a career. They passed this direct experience on to their sons who strove to pursue advancement on precisely those levels where their non-academically trained fathers had encountered insurmountable barriers. Unlike artisan and peasant children, the upwardly mobile sons of bureaucratic officials were already part of the entitlement structure, thought in its categories and were acquainted with its methods and social mechanisms. Therefore it was far more difficult to deflect the aspirations of this group. The futility of the government's attempt to restrict the advancement of this state-employed strata illustrates that the higher bureaucratic apparatus was not only the beneficiary but also the captive of the system which it had produced. This nexus which was already apparent in the Empire, became extremely clear at the end of the 1920s. The Prussian Minister of Culture, C. H. Becker, deplored the growing functionalization of courses of study as a bureaucratization of "our beautiful and glorious scholarship."[25]

Third, because of the cumulation of the cyclical deterrent, displacement and attraction effects the majority of students who had reached the university from the lower middle classes during the expansion concentrated in the less prestigious "open" faculties. The exclusive faculties or careers remained largely untouched by the throng of petit bourgeois rivals. Before World War One, 71% of sons of middle and lower officials and 77% of sons of elementary school teachers were enrolled in the "open" faculties, already 61% and 64% of each in the philosophical faculty. The quota of academics in the teaching fields was only half as great as in the medical and legal faculties. The thesis that the "open" philosophical faculty became even more open during the expansion phase is emphatically confirmed when one considers financial aid as a further indicator. In 1911 a good 54% of all financial support, i. e., individual aid through scholarships, free lunches, postponement of and exemption from fees, was for students in the philosophical faculty. Whereas at the end of the 1880s only one-fifth of all aid officially used for scholarships and free lunches was allotted to students in the philosophical faculty, in 1911–12 half of all financial aid went to their support.

25. R. Graf von Westphalen, *Akademisches Privileg und demokratischer Staat* (Stuttgart, 1979), 136ff.

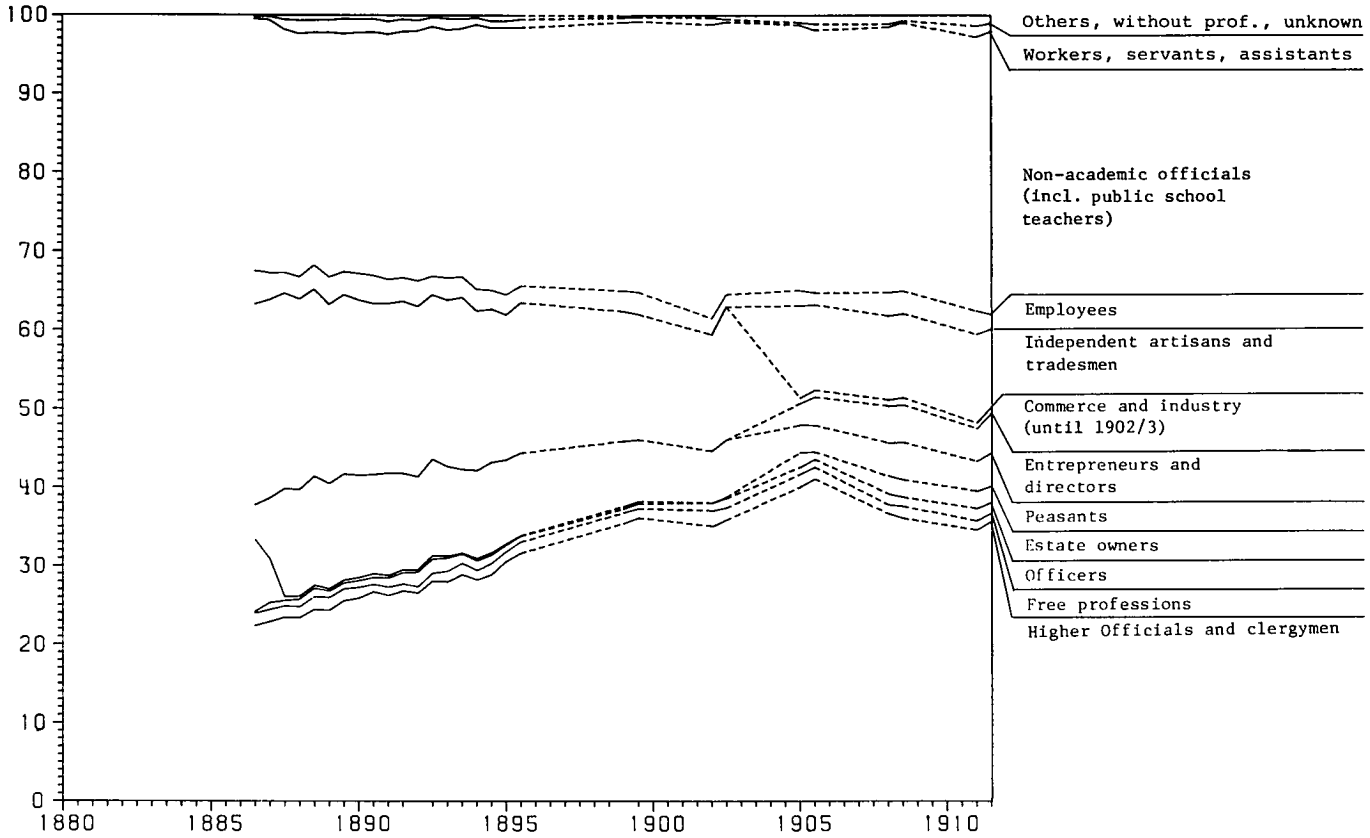
Fourth, the social order of faculties experienced one important shift before World War One. The traditionally open faculty of Protestant theology moved a step "up" in the hierarchy; it developed towards the two exclusive medical and legal faculties and away from the philosophical and Catholic theological faculties. Three causes combined here. First, the known deterrent and displacement effects of the oversupply crisis at the turn of the century contributed to greater exclusivity due to diminished demand. Second, the increase in students from the lower middle class largely passed by the faculty of Protestant theology, since all major academic careers, except for the clergy, grew considerably during the Empire. Third, the prestige loss due to secularization brought about a collective reorientation of biographical decisions. The great majority of sons of middle and lower officials changed its perspective at the end of the 1890s. The future no longer belonged to spiritual callings in the church but to secular teaching in the schools. A similar rethinking took place in the artisan and peasant strata who had made up a large contingent of candidates for the clergy well into the last third of the 19th century. Medicine became even more attractive for those from rich families and for the majority teaching became a realistic alternative. As the social profile of Protestant theological faculties reveals (Graph 8), children of all categories of bureaucrats made up three-fourths of theological candidates (76%). The career became more exclusive because artisan and peasant sons were less frequent and the proportion of academic children grew since a solid stock of traditionalist families remained faithful to the calling. In contrast to the general trend of diminishing academic proportions, during the previous decade the Protestant theological faculty showed a considerably greater percentage of academic children than the exclusive legal and medical faculties. From the expansion phase of the 1860s on, the philosophical faculty took up the legacy of the theological faculty in two respects. It assumed the lead in enrollments and now became the great catch basin into which poured the flood of the educationally motivated from middle and lower classes who had earlier studied theology.

Four Types of Crises:

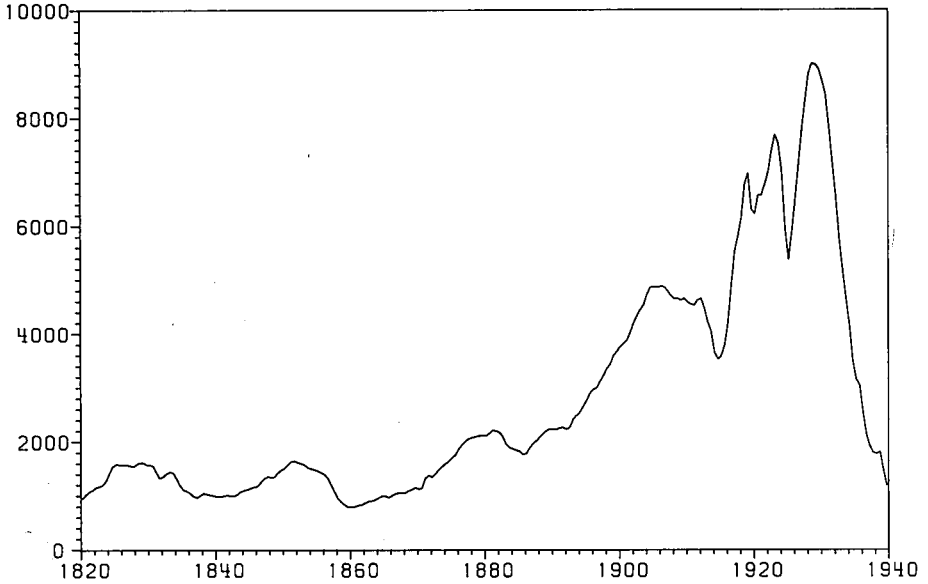
If the analysis includes the varying growth conditions as a second dimension along with the different recruitment bases, then the proposed cycle theory must be broadened. Until the beginning of the modern growth in academic careers in the last third of the 19th century, two crisis types can be distinguished. The first relates to professions with a relatively exclusive recruitment base (such as medicine and law). Cyclical fluctuations were relatively insignificant since deterrent and attraction effects of changing professional prospects encountered a comparatively stable recruitment base and had a correspondingly small impact on selection. Student enrollments in the law faculty at old Prussian universities embody this type (Graph 9).

The second variant relates to professions with a relatively open recruitment base (such as the Protestant clergy). In this career, cyclical fluctuations in demand rose and fell with steady intensity. Because of strong deterrent and attraction effects on the unstable recruitment base, severe oversupply and deficit crises periodically succeeded each other. Enrollments in Protestant theological faculties at old Prussian universities embody this second crisis type (Graph 10). For instance, enrollments in the Protestant theological faculty in Göttingen rose and fell between 1767 and 1940

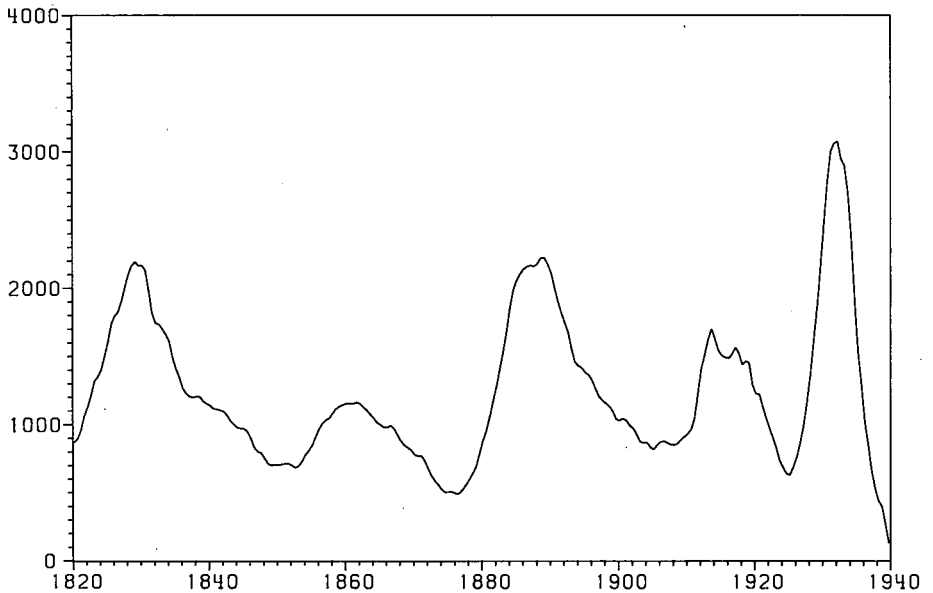
Graph 8: Social Profile of Prussian Students in Protestant Theology Faculty
(Proportion of students according to fathers' profession)



Graph 9: Students of the Law Faculty at Old Prussian Universities



Graph 10: Students of Protestant Theology at Old Prussian Universities



on a long-term stable level with fairly regular fluctuations. This remarkable steadiness can be explained by looking at the job market on which the faculty was functionally based. The regional areas of supply and demand largely coincided and formed a relatively closed system. The number of positions for pastors and other clerical appointments in Hanover remained constant over generations. As one can see by the examination and candidate statistics which the Hanoverian Consistory continually and carefully compiled, at least since the beginning of the great prerevolutionary oversupply crisis, enrollment cycles corresponded closely to deficit and oversupply phases for clergymen. The higher church bureaucracy was very much aware of the regular fluctuations in candidates and understood their recurrence as a natural fate to which the whole church as well as individual clerical candidates had to submit patiently. Faced with the frightening influx into this career in the *Vormärz*, they reassured themselves with the insight that "both the ebb and flood tide have often alternated in the supply of our candidates. The memory of old preachers confirms that this is inherent in the nature of things."[26]

A cyclical structure similar to that of the Protestant theological faculty in Göttingen is apparent in numerous other universities. The second crisis type is especially obvious at the Prussian universities in Breslau and Königsberg and in the non-Prussian institutions in Erlangen and Heidelberg.

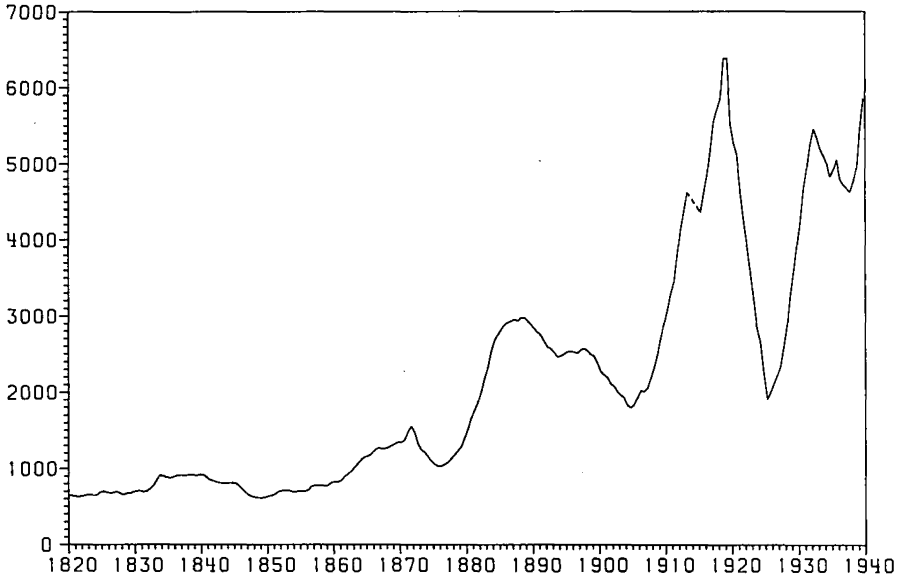
The two first types embody the structural pattern of periodic recurrence of oversupply and deficit under relatively stable conditions. Cyclical fluctuations in academic demand oscillated around an almost constant "normal" level. Under growth conditions from the last third of the 19th century on, this structural pattern persisted, but oversupply and deficit recurred periodically on an increasing scale, depending upon growth. Cyclical downswings returned to different levels. Fluctuations of enrollments grew more intense according to respective conditions. Since, as a rule, each expansion was connected with a periodic opening of the career to "below," even the relatively exclusive courses of study generally broadened their access during growth phases.

A third crisis type can be defined for careers with a relatively exclusive recruitment base during growth conditions. The social mechanisms which characterized this version during fluctuations can be studied especially well in the medical faculties. The particular pattern of effects which together governed access chances kept this career relatively exclusive, despite a temporary "downward" opening during expansion phases and maintained its distance from "open" careers. Even during growth, the double selectivity of oversupply and deficit replicated and confirmed the hierarchical structure of academic professional reproduction. Although the recruitment bases shifted in the short range, "downward" during deficits and "upward" during oversupply, the more exclusive careers remained elitist and the open careers relatively accessible over generations in a complex balance. Enrollments in the medical faculties of old Prussian universities and at Erlangen embody this third variant (Graph 11).

If openness and growth coincide in a specific recruitment pattern, then the cumulative effects become most evident. The secondary teaching career embodies this fourth crisis type. It was relatively open and expanded rapidly up to the First World War. Oversupply and deficit crises made themselves keenly felt. Favorable prospects

26. *Vierteljährliche Nachrichten von Kirchen- und Schulsachen* (1836), 43–46; *ibid.* (1838), 45ff.

Graph 11: Students in the Medical Faculty at Old Prussian Universities



in open careers unleashed unprecedented attraction effects under expansion conditions which promised especially swift appointment and promotion. Because the "demand" was so great, the subsequent overcrowding was so large; in turn, strong deterrent effects produced recurrent deficits, etc. Three special investigations concerning the oversupply crises in secondary teaching have opened the way to a comparative historical analysis from the prerevolutionary period through the Empire to the Third Reich. The comparison of the three successive crises demonstrates that the problem of cycles of oversupply and deficit intensified each time.[27]

Duration and Structure of Long Cycles:

Since research in this area is only beginning, no absolute answers can be formulated concerning the duration and structure of the long cycles of enrollments in certain fields of study. Several hypotheses emerge which must be tested in further analyses. First, the completely deviant pattern of Catholic theology is confirmed here as well (Table 2). The priesthood clearly exhibited the longest cycles (40–45 years). The analysis of the functional causes for this remarkable divergence from the general struc-

27. Herrlitz/Titze, "Überfüllung als bildungspolitische Strategie"; A. Nath, "Der Studienassessor im Dritten Reich," *Zeitschrift für Pädagogik* (1981); and H. Titze, "Lehramtsüberfüllung und Lehrerauslese."

ture suggests unusual recruitment conditions. Because of celibacy the priesthood was the only academic career in which professional inheritance played no role. The repeatedly emphasized broad recruitment from the middle and lower strata must also be taken into account. The steering efforts of the Catholic hierarchy also should have had a considerable effect. These complex special conditions lead one to expect that, in comparison to all other careers, long deficit phases were typical for the priesthood.

Second, the cycles in the major careers (Protestant clergy, lawyers, doctors, teachers) seem to become shorter as they approach the present. Because of the incomplete sources before 1830, the contraction thesis can be tested at only a few individual universities for which suitable data are available. Göttingen University (Table 2) demonstrates that the two cycles at the end of the 18th century and during the prerevolutionary period were considerably longer than the subsequent waves in the 19th and 20th centuries. The point after which they systematically shorten appears to lie in the mid-19th century.[28]

For the time being, the functional prerequisites of this actual shortening of cycles can only be formulated generally and hypothetically. The transformation of communication structures since the mid-19th century doubtlessly played a considerable role. The social mechanisms which lay beneath the cyclical recurrence of oversupply and deficit accelerated, and participation in exchange processes intensified. Increasing administrative control and interest group organization of the academic professions in the last third of the 19th century also played a significant role.

Third, the structure of the waves does not yet reveal any "learning processes." Largely unaffected by changing political conditions, oversupply and deficit cycles in academic careers recurred in a "natural" manner from enlightened absolutism to the present. This essay attempted to expose such "natural" necessity as a socially produced mechanism. It therefore becomes apparent that specific social interests structured the process, and gave it direction and remarkable stability. In comparison with the dynamics of this "system development" itself, the freedom for political decision was relatively small.

There is something to be said for the hypothesis that the specifically German entitlement system which functionally links "education" and "society" can be interpreted both as program and product of this development. Its fundamental characteristics were institutionalized in the last decades of the 18th and first decades of the 19th centuries. The entitlement structure was permanently shaped by the neohumanist conception of the union of state and culture. The sociological consequence of this meritocratic conception was a "functional" stratification theory which was "bureaucratically" realized in the 19th century (in a hierarchical career system in public service as a prototype for the private sector) under the pressure of social interest groups and specifically German conditions.[29]

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28. The duration of the cycles was studied through auto-correlation analysis which indicates that the transition from longer to shorter waves occurs around 1850.
29. R. von Westphalen, *Akademisches Privileg;* B. Wunder, *Privilegierung und Disziplinierung. Die Entstehung des Berufsbeamtentums in Bayern und Württemberg (1780-1825)* (Munich/Vienna, 1978).

At the price of cyclical recurrence of oversupply and deficit (along with other "social costs") this German entitlement system governed the social recruitment of academic professions and effectively legitimized their status privileges for over 150 years. The function of the entitlement system became more institutionally entrenched, comprehensive and tightly structured with each new examination statute and career regulation. Established over generations, this system grew increasingly impervious to political efforts to transform it fundamentally. Cultural officials in the Empire still had illusions of control but their successors in the Weimar Republic no longer shared them, because they were aware of their impotence.

Patrick L. Alston

The Dynamics of Educational Expansion in Russia

Between 1850 and 1940, amidst wars, revolutions, expanding and contracting frontiers, Russians and Soviets pondered the appropriate size of their student population. From the beginning political leaders related volume to academic type and social composition. In 1850 Tsar Nicholas imposed severe restrictions on enrollments at the six state universities while exempting some dozen specialized institutes. In the 1930s Comrade Stalin came close to dissolving the universities into institutes. In the 1880s and 1920s admissions were manipulated to favor social groups dear to the political leadership. In each century the political leaders also consistently subordinated enrollment dynamics to state security. Meanwhile, from generation to generation, the attending young people, long rebellious, now complaisant, exhibited a willingness to pursue any field of study in the allowed numbers as long as it did not include Latin or Greek.

Following the European pattern in general, and the Prusso-German model in particular, Russia's higher, post-secondary population consisted of men, increasingly after 1900 of women, usually graduates at the age of 18 or 19 of specified upper secondary schools, pursuing four- to five-year programs in such fields as law, medicine, or engineering at universities or institutes. Data on this population is incomplete. Since there was no single agency responsible for technical higher schools, as the Ministry of Education was responsible for the universities, there is a dearth of coherent information on institute volume especially before 1900; after 1918 the universities had their fields of study reported as components of the specialized higher educational mass. This study recognizes the severe statistical discontinuities occasioned by census enumerators and therefore proceeds in three parts.

Reform Expansion 1860–1900:

In 1859, after defeat in the Crimean war had shaken Tsardom to its felt boots, enrollment at the six state universities was allowed to rise to a record high of over 5,000, some 500 above the previous high of 1848 (up from 2,000 in 1836), and considerably above the anti-revolutionary low of 3,000 imposed in 1850. Closed in 1861 following student disturbances associated with the emancipation of the serfs, the universities received a new charter in 1864 granting considerable self-rule. Their re-opening in

1865 introduced the period of reform expansion that was to last until student riots in 1899 heralded the revolutionary age.[1]

Russia entered the Reform period with some 12 major institutes, concentrated in Moscow and St. Petersburg, specializing in such fields as mining, medicine, forestry, engineering, and law. Between 1860 and 1900 at least 12 more major institutes were opened (considerably more than the three new universities), again mostly in the two capitals, adding electrotechnics in St. Petersburg and oriental language training at the Vladivostok end of the newly opened Trans-Siberian railroad. The school census of 1880 counted more than 6,100 students in specialized higher schools, not including 1,010 in four clerical and three military academies. The total of 7,120 approached the 1880 university enrollment of 8,045. Among the major institutes, the Military Medical Academy enrolled 1,300. Only the capital universities were larger. Riga Polytechnical with 675 rivaled Kharkov and Kazan universities in size.[2]

By the late 1880s under Sergius Witte, Russia took the plunge into rapid industrialization. By the 1890s economic growth began to shift emphasis away from university to institute expansion. The graduates of the classical gymnasia designed to supply the universities were the prime suppliers of institute admissions. Of the 225 students entering the Kharkov veterinary institute in 1890, one came from an agricultural school, 28 were graduates of realschulen, and 195 holders of the Maturity from gymnasia.[3] Popular institutes were turning away applicants. In 1894 seven of the most prominent admitted 608 from 2,647 applicants.[4]

Nevertheless, the nineteenth century belonged to the expansion of government and university enrollment. In the early 1800s the university system had been created to supply the state with a management class trained in European science. Legislation in 1809 made university-level examinations mandatory for promotion in the civil service table of ranks created by Peter the Great in the 1720s. The decree of 1834 ranked state officials according to the three standard European educational levels. The legal connection between lower, secondary, and higher cognitive training and bureaucratic levels remained in force until 1917. In the 19th century the political leadership emphasized university expansion as a principal means for rationalizing the growth of government. In the 20th, it would promote institute expansion as a principal means for rationalizing the growth of the economy.

The 19th century registered an extraordinary growth in the state apparatus. At the end of the 18th century (1796), for a population estimated at 36 million, the number of government officials stood at 15 to 16,000: one bureaucrat for every 2,250 subjects. The 1851 census registered a population of 69 million with an official corps of 74,330: one agent for every 929 subjects. In 1903 the official corps had grown to an

1. Patrick L. Alston, *Education and the State in Tsarist Russia* (Stanford, 1969), 45.
2. V. R. Leikina-Svirskaia, *Intelligentsiia v Rossii vo vtoroi polovine XIX veka* (Moscow. 1971), 55.
3. Alston, 275, fn. 25.
4. Leikina-Svirskaia, 113. In 1900 the Ministry of Education imposed norms on the institutions of higher learning, both technical schools and universities, limiting the rise in new registrations to a 10 percent increment over the previous year. The regulations were not strictly enforced. Alston, 278, fn. 36.

army of 385,000 while the population (1897) had reached 129,000,000: one official to every 335 of the Tsar's subjects.[5]

The expansion of local government was a second specific force which contributed to the increase of university population after the Crimean War. With the landlord system of local government abolished by the emancipation of the serfs, new forms of district government had to be devised, the zemstvos. After 1864 the zemstvos competed with the state bureaucracy (expanding in part to supervise the zemstvos) for the doctors, lawyers, teachers, and scientists graduating from the expanding universities.

Two sets of figures are available for penetrating university dynamics (Table 1).[6] From 1865 to 1899 university enrollment increased 3.6 times (L). From 1865 to 1900 (without Warsaw) it increased 3.5 times (J). During the 35-year Reform period it increased at an average annual rate of 7.2 percent. From 1865 to 1885 the university population grew within the organizational framework of the statute of 1864 which granted local control to the faculties. In 1884 a revised statute insured central control.

The 1875–1885 decade of growth came after a stuttering start which impeded expansion for five years as the regime experimented with social and academic levers for controlling admissions. In 1872 the Ministry of Education made state final examinations for gymnasium graduates a prerequisite for university admissions. University registration dropped from 7,251 in 1872 to 5,692 in 1874. One motive behind tighter state control was to reduce dropouts, which did decline from a high of 1,069 in 1871 to 778 in 1877. The upgrading of the gymnasium with an eighth year in 1872 slowed university growth temporarily. Initially seminarians were exempt from state admissions examinations. They flooded first-year classes, especially in Odessa where they constituted 52 percent of admissions in the mid-1870s, bringing their "moral shortcomings and low academic achievements" with them, until their privileges were abolished in 1879.[7]

The political leaders in charge of state schools fully realized that the key to controlling the type and volume of higher expansion lay with secondary design. In the 1860s, Count Dmitry Tolstoy, Tsardom's most hated and effective Minister of Education, created a number of realschulen on the Prusso-German model to deflect secondary enrollment from the universities and toward higher technical institutes or directly into the skilled labor force. Despite official and public resistance, the Tolstoy realschule (the unacknowledged forerunner of the contemporary Soviet 10-year secondary school) expanded from 56 with 10,900 students in 1876 to 115 with 39,800 in 1900. In 1860 the gymnasia numbered 84 with 17,00 pupils. In 1899 they numbered 196 with 70,800. Under Tolstoy's firm leadership both the gymnasia and the connection between them and the universities were made more efficient. The means used were primarily academic, but the language was socially insulting. Despite public outrage, Tolstoy's policies reduced the number of academically weak pupils admitted

5. P. A. Zaionchkovskii, *Pravitel'stvennyi apparat samoderzhavnoi Rossii v XIXv* (Moscow, 1978), 221.
6. The L figures are from Leikina-Svirskaia, the J figures from William H. E. Johnson, *Russia's Educational Heritage* (New York, 1969, 2nd ed.).
7. Allen Sinel, *The Classroom and the Chancellery: State Educational Reform in Russia under Count Dmitri Tolstoi* (Cambridge, Mass., 1973), 99–100.

Table 1: Total University Enrollment, 1865–1900

	1865		1875		1880	1881	1885		1894	1895	1899	1900
	L	J	L	J	L	J	L	J	J	L	L	J
With Warsaw			5,569		8,045		12,804			14,109	16,294	
Without Warsaw	4,125	4,641	5,032	5,151	7,397	9,344	11,551	11,544	13,169	13,217	15,180	16,357

Table 2: Individual University Enrollments, 1865–1900

		1865		1875		1880	1881	1885		1894	1895	1899	1900
		L	J	L	J	L	J	L	J	J	L	L	J
	Organized												
Moscow	1755	1,519	1,741	1,168	1,201	1,890	2,504	2,874	3,179	3,761	3,906	4,407	4,562
Petersburg	1819	524	785	1,123	1,223	1,677	2,155	2,282	2,340	2,675	2,768	3,758	3,613
Kiev	1835	497	555	666	772	1,041	1,337	1,821	1,589	2,453	2,313	2,606	2,602
Kharkov	1804	524	588	407	430	637	937	1,372	1,372	1,090	1,275	1,387	1,506
Kazan	1804	289	413	463	512	791	825	925	969	816	751	818	906
Dorpat	1802	594	560	832	735	1,105	1,164	1,704	1,485	1,496	1,301	1,733	1,647
Odessa	1865	178		273	281	346	422	573	610	506	506	714	954
Warsaw	1869			537		648		1,253			892	1,114	
Tomsk	1888									377	397	447	557

and actually raised the number of graduates, the academic bottom line. In the major eight of the 15 school districts into which the empire was divided (the eight contained over 90 percent of total pupils) total graduations climbed from 2,014 in 1885 to 2,679 in 1890 as total enrollment dropped from 53,027 in 1885 to 43,519 in 1890. In the same eight districts the ratio of gymnasium graduates to total enrollment stood at 26.3 to 1 in 1885 and 16.2 to 1 in 1890.[8] Between 1865 and 1900 the gymnasium population increased 2.6 times, the university population 3.5 times. As fewer pupils dropped out and more graduates went on to the higher level for which they had been expensively trained, the proportion of total gymnasial to total university enrollment dropped from 8 to 1 in 1865 to 5 to 1 in 1900. This was superior management in any century.

Nine universities contributed their individual dynamics to aggregate performance. Institutional patterns broadly registered the force of site and tradition in a school's attraction for students (Table 2). Through the Reform period, Moscow remained the principal institutional component of macro dynamics. Its share of total enrollment stood at 37% in 1865, or at 27% in 1900. Between 1865 and 1875 Moscow was the major drag on overall expansion. St. Petersburg was the most expansive tributary of aggregate growth. During the Reform period its share of the total increased from 12% in 1865 to 22% in 1900 without benefit of a medical school. The growth of the two capitals accounted for close to 50% of the aggregate in 1865 and 1900.

Kiev and Kharkov constituted Ukrainian growth, accounting for 24% of the aggregate in 1865 and 1900. Kiev was the more dynamic. In 1900 its share of total registration reached 15%. Dorpat and Warsaw represented western frontier growth, Dorpat the old German school, Warsaw the new Polish. Both adhered to the macro pattern of reform expansion.

Kazan, Odessa, and Tomsk were the smaller schools. Kazan represented old growth on the upper Volga and Odessa new institutional growth on the Black Sea. In 1876 the Governor-General of Siberia warned that unless his region acquired a university, it would never have "a sufficient number of experienced, trained and conscientious personnel" necessary to "make its natural resources productive". Lack of finances after the Russo-Turkish War forced delay. Finally, in 1888, after generous local funding, Siberia got its first university at Tomsk.[9] Odessa was the most expansive of the small three. By 1900 it had caught up with Kazan with a 5% share of enrollment. The decline of their smaller populations in 1885–1895 contrasted with the simultaneous increases of the largest three.

Institutional patterns fed macro dynamics from nine streams. Students enrolled in one of four fields: Liberal Arts (historical-philological faculty), Natural Science (physics-mathematics), Medicine, and Law. Field dynamism was partly an expression of student choice nurtured by family background, personal tastes, the changing social prestige of the professions, the fame of individual professors, and above all, if we are to believe the memoirs of the time, the young man's judgment on how best he might serve the "dark" peasant masses, who had illiterate ideas of their own beyond the grasp of those determined to rescue them from history with science (Table 3).

8. The figures are in Alston, Appendix A.
9. Sinel, 89–90.

Table 3: University Enrollment by Fields, 1865–1899

	1865	1870	1875	1880	1885	1890	1895	1899
Liberal Arts	260	474	496	897	1,194	729	697	685
Natural Science	962	1,055	904	1,714	2,465	2,438	2,826	3,837
Law	1,953	3,047	1,867	1,831	3,670	4,071	5,103	7,182
Medicine	839	1,375	2,114	3,499	4,704	4,860	5,171	4,999

Law dominated the field dynamics of Reform expansion. In 1865 its share of the four fields was 48%; it was 42% by 1899. While total population was expanding 50% between 1875 and 1880, the legal field was declining two percent. Between 1880 and 1885 total enrollment expansion was powered by a delayed boom in Law.

Medicine was the most expansive of the four fields, its share of students increasing from 20% in 1865 to 39% in 1875. In 1895 Medicine and Law converged, each with 37% of the whole. During the decade of slow expansion, 1865–1875, while aggregate population was increasing 10%, Medicine mushroomed 151%, mitigating the macro slump of 1870–1875.

Natural Science exhibited the steadiest, least volatile, field performance, quadrupling its enrollment volume in 1865–1899. Its 23% share of the gross in 1865 was still at the same level 34 years later in 1899. In contrast Liberal Arts followed a rising and falling line. Its 6% share of the population in 1865 shrank to 4% in 1899.[10]

During the Reform period, poverty, that universal stimulant/depressive, was a major force in university expansion. An average of 2,000 students a year enjoyed tuition exemptions while some 40 to 60 percent received some form of financial assistance in the 1860s and 1870s.[11] The universities provided a social elevator for those without wealth and the family connections described by Tolstoy in his great novels of gentry life. The wealthy attended military schools like Anna Karenina's Vronsky. The poor, like Anton Chekhov, studied medicine. State fellowships which were tied to service in secondary education could not attract them in large numbers to the shrinking Liberal Arts.

The census of 1897 calculated that 97,600 men and 6,300 women had studied at a university or equivalent higher school, not necessarily to completion. In addition, 29,600 men and 619 women had studied for an indeterminate time at a technical in-

10. Field figures are from Leikina-Svirskaia. The examination of field performance at individual institutions reveals patterns unseen at the aggregate levels. For instance: Law enrollments were most expansive at St. Petersburg, least expansive at Moscow. While St. Petersburg was multiplying Science 5 times between 1865 and 1899, Moscow was multiplying it 3.25. The trend in the Medical field during Reform expansion was toward a more even dispersion of medical students among the various schools. At the same time Liberal Arts showed a movement toward concentration of students in St. Petersburg and Moscow.
11. Sinel, 101.

stitute. Of this number at least 58,000 were full-fledged university graduates and another 7,783 graduates of institutes with university fields. Nine major institutes had produced 13,086 graduate engineers and technicians while 3,800 had graduated from forestry and agronomy schools.[12]

Despite the increase in trained talent, the educational level of key government agencies remained dangerously low. The landed gentry still clogged career streams with social privileges sometimes annulling academic prerequisites. Legal gentry favoritism in the civil service was not abolished until 1905. Especially low at the end of the 19th century was the cognitive level of officials in the Ministry of Internal Affairs, responsible for the police and internal security. Of 1,609 persons entering service 1894/95, 17% had some higher education, 10% some secondary, and of the 72% with lower education, one-fourth had not completed the three-year elementary district school.[13]

With staffs of comparable training for controlling the passions of 125,000,000 Slavs, Turks, Lithuanians, Finns, and Georgians, the old leadership faced two wars and two revolutions in the first 17 years of the 20th century. Out of the struggle would emerge a new leadership with a revised attitude toward science, higher education, and its expansion.

Revolutionary Expansion 1900–1928:

Between 1900 and 1928 the Russian Empire boiled away in three revolutions and three wars, resulting in a population deficit of nearly 28 million or 16 percent of the expected population (1926 census).[14] The reduced territory with its exhausted population was reorganized as the Soviet Union. The period closed with the universities on the brink of dissolution. It opened with an unprecedented upsurge, a doubling of enrollments in less than a decade (Table 4).[15]

During the Revolution of 1905 Witte's Minister of Education rescinded the ban on seminarians, allowed realschule graduates and commercial high school graduates to enter the university on passing a Latin examination, and revoked an order forcing secondary school graduates to attend the university closest to home. As the mobs took over the streets, faculty ignored the statute of 1884 and admitted Jews and women as regular students or as auditors. Jewish enrollment increased from 2,247 in 1904 to 4,266 in 1906–1907. By 1907–1908, 10,364 students squeezed into St. Petersburg which had registered 4,652 in 1904. The number of lower class students in the capital rose from 14.4% to one-third between 1904 and 1908.[16]

Between 1908 and 1911 political unrest rocked the universities; mass expulsions of students and mass resignations of faculty paralyzed the pursuit of pure European science at Moscow University. In 1912 Nicholas II emulated Nicholas I in an in-

12. Figures extracted and totaled from Leikina-Svirskaia, 69–70.
13. Zaionchkovskii, 34.
14. Frank Lorimer, *The Population of the Soviet Union: History and Prospects* (Geneva, 1946), 39.
15. Johnson, 287.
16. Samuel Kassow, "The Russian University in Crisis, 1907–1911: The Evidence from the Archives," *Slavic and European Education Review*, 1 (1978), 2.

Table 4: University Enrollments, 1900–1912

	1900	1904	1906	1909	1911	1912
Petersburg	3,613	4,652	7,442	8,663	8,227	7,282
Moscow	4,562	5,810	8,419	10,086	9,242	9,390
Kiev	2,602	3,099	4,179	4,857	4,098	4,857
Kazan	906	1,308	2,821	3,049	3,487	2,955
Kharkov	1,506	1,792	3,216	4,936	5,274	3,315
Dorpat	1,647	1,872	1,902	2,415	2,749	2,251
Odessa	954	2,162	2,456	3,232	3,193	2,756
Tomsk	557	811	998	1,110	1,347	412
Saratov				92	289	412
Totals	16,347	21,506	31,433	38,440	37,906	34,110

struction to the Council of Ministers on expansion: "I think Russia needs higher technical institutions and *even more so* intermediate technical and agricultural schools, but the already existing universities are sufficient. Take this resolution to be my guiding order."[17] The Tsar's decree would be echoed by Stalin, Khrushchev, and Brezhnev.

As the government recovered from the Revolution of 1905 it reduced university enrollments from the all-time Tsarist high in 1909. Only Tsardom's last full year, 1916, registered a slight increase to 35,695 despite World War I. In the midst of war and revolution two new universities were opened, at Perm in 1916 and Rostov in 1917.

By 1912 the distribution of fields had shifted slightly from 1899. Law maintained its dominant 40% with 14,477. With 3,106, Liberal Arts increased its share of total university enrollment from four to nine percent. Medicine with 9,238 and Natural Science with 9,036 divided the remaining 50 percent.[18] The marked increase in Liberal Arts remains to be clarified.

After the Revolution of 1905 Higher Courses which provided women with the equivalent of a university education exploded, from 5,174 students in 1905 to 28,274 in 1912. By 1914 some 85 institutes enrolled an estimated 62,000 students. Figures are available for some 30 institutes for the years 1899 to 1912 (Table 4).[19]

17. Kassow, 16.
18. James McClelland brought this data to my attention in D. I. Bagalei, "Ekonomicheskoe polozhenie russkikh universitetov," *Vestnik Evropy* (Jan., 1914), 58–59.
19. For Higher Women's Courses see Nicholas Hans, *History of Russian Educational Policy 1701–1917* (London, 1931, reissued 1964), 241. Institute figures are from Johnson, 288–289.

Table 5: Institute Enrollments, 1899-1912

Male Enrollment in Russian Institutions of Higher Learning, except Universities [excluding Poland and Finland]

NAME AND LOCATION OF INSTITUTION	Organized	NUMBER OF STUDENTS			
		1899	1902	1907	1912
Institute of Mining (SP)	1773	480	550	664	640
Military-Medical Academy (SP)	1799	768	750	750	900
Forestry Institute (SP)	1803	501	516	565	560
Bezborodko Lyceum (Nezhin)	1805	87	81	98	131
Institute of Ways of Communications (SP)	1810	886	894	900	1,384
Commercial Academy (M)	1810	403	?	?	4,261
Alexander's Lyceum (SP)	1811	106	?	?	290
Lazarev Institute (M)	1815	36	59	130	141
Technological Institute (SP)	1828	1,016	1,109	1,610	2,525
Higher Technical School (M)	1830	865	1,989	2,000	3,000
School of Law (SP)	1835	112	330	330	350
Institute of Civil Engineers (SP)	1842	353	530	510	810
Riga Polytechnic Institute	1862	1,446	1,701	1,750	2,088
Petrovskii Agricultural Academy (M)	1865	198	225	500	1,000
Historico-Philological Institute (SP)	1867	94	88	107	134
Demidov Lyceum (Yaroslavl)	1868	281	456	665	669
Nicholas' Lyceum (M)	1869	24	?	201	277
Archeological Institute (SP)	1879	195	?	?	542
Kharkov Technological Institute	1885	812	1,000	1,200	1,400
Electrotechnical Institute (SP)	1886	143	300	362	750
School of Engineering (M)	1896	236	380	567	580
Kiev Polytechnic Institute	1898	598	846	1,370	2,500
Ekaterinoslav Mining Institute	1899	--	128	250	480
Vladivostok Oriental Lang. Inst.	1899	--	76	125	127
Tomsk Technological Institute	1900	--	100	812	1,171
Polytechnic Institute Sosnovka (SP)	1902	--	--	700	5,215
Psycho-Neurological Institute (SP)	1907	--	--	--	2,590
Novocherkassk Polytechnic Institute	1907	--	--	--	704
Shaniavskii University (M)	1908	--	--	--	3,669
Oriental Academy (SP)	1909	--	--	--	102

In 1914 an estimated 127,000 students were enrolled in 105 higher schools: some 35,000 men in universities, about 34,000 women in Higher Courses, and 58,000, mostly men, in specialized institutes. The increase in the number and enrollment of institutes indicated a positive response on the part of public and government to Witte's admonition (made from exile in the Concil of State) that Russia must have schools of European quality not only on traditional political grounds but on economic grounds alone, given the world commercial competition of 1912.[20]

Between 1905 and 1915, an estimated 22,000 boys and girls were graduating annually with the maturity certificate permitting access to higher education. Some 10% of them were unable to gain admittance because of crowded conditions. While the number of secondary schools had doubled, only one new university had been opened. In May 1916 the Minister of Education recommended opening 10 new universities in various parts of Russia.[21] His recommendation would be carried out by men returning from Switzerland and Siberia.

The revolution introduced further uncertainty into enrollments. By the end of 1917 most students had left the lecture halls for the streets. The number of those actually studying fell to a handful. After the new Soviet regime introduced open admissions without secondary prerequisites, tertiary enrollments soared to over 200,000 and then fell off, victims of famine, typhus, civil war and lack of adequate academic preparation. By 1924 the political leadership had struck an uneasy truce with the peasantry and some semblance of order was restored. Student populations stabilized and began to climb as limited economic recovery took hold (Table 6).[22]

Of the 152 higher schools in 1928, 19 were universities, ten of them founded after 1918 in Baku, Minsk, Voronezh, Gorkii, Dnepropetrovsk, Erevan, Irkutsk, Tashkent, Tbilisi, Sverdlovsk. The names are partly a roll-call of Soviet nationalities. Two of the old Tsarist national universities reverted to their independent countries, Warsaw to Poland, and Dorpat/Yurev to Tartu in Estonia.

In the mid-1920s some 50,000 boys and girls were graduating annually from the nine-year secondary school with maturity certificates. At the same time 22,000 were being admitted to the higher schools, only half of them with the maturity certificate. Thus some 10,000 or 20% of those with formal academic qualifications were going on to higher education. It would be a decade before the Soviet government would adjust the academic leverage regulating the flow of graduates from level 2 to level 3. During its first decade it subordinated academic concerns and expansion to its social program. In 1924–1935 some 18,000 students were purged, many for belonging to the wrong social class.[23] With the declaration of war on the peasantry, its collectiviza-

20. Alston, 281, fn. 7.
21. Paul N. Ignatiev and Others, *Russian Schools and Universities in the World War* (New Haven, 1929), 197.
22. Figures are in Seymour M. Rosen, *Education and Modernization in the USSR* (Reading, 1971), 196 and Alexander G. Korol, *Soviet Education for Science and Technology* (New York, 1957), 132.
23. Oskar Anweiler, *Geschichte der Schule und Pädagogik in Russland vom Ende des Zarenreiches bis zum Beginn der Stalin Ära* (Berlin, 1978 2nd ed.), 205, fn, 100; James McClelland, "Proletarianizing the Student Body: The Soviet Experience during the New Economic Policy," *Past and Present*, 80 (1978), 130.

Table 6: Combined University and Institute Enrollments, 1914–1928

Year	No. of Schools	Thousands of Students
1914	105	127.4
1922	248	216.7
1923	187	208.3
1924	169	169.5
1925	145	167.0
1926	148	168.0
1927	148	168.5
1928	152	176.6

tion, and the inauguration of the first Five-Year Plan for converting an unmanageable agrarian mammoth into an obedient industrial giant, Stalin's slogan "Cadres decide everything" decided the future of Russian science, higher education, and its expansion. All three were harnessed to the economic growth that alone could stave off defeat in the next war. A new era, plan expansion, began.

Plan Expansion 1928–1940:

Plan expansion inaugurated a convulsive increase in the number of schools, primarily achieved by breaking up existing universities and institutes into specialized fields. The five departments of the Higher Technical School founded in Moscow in the 1830s provided the nuclei for five Soviet engineering institutes. Subsequently some institutes were consolidated and the universities restored, at least in name. The number of higher schools shot up from 152 in 1929 to 579 in 1931, peaked at 832 in 1933 and dropped to 688 in 1935. Among this array of schools were two new universities at Samarkand and Alma Ata, inviting Uzbeks and Kazakhs into the cadre pool.

The year 1928 provides the base for measuring expansion. Announced in 1928 to start in 1929, Plan One was completed in four years. Plan Two ran for five years. World War II interrupted Plan Three (Table 7).[24]

24. Figures for Tables 7, 8, 9 from Nicholas De Witt, *Education and Professional Employment in the U.S.S.R.* (Washington, D.C., 1961).

Table 7: Total Higher Education Enrollment, 1928–1940
(In Thousands)

Plan 1					Plan 2					Plan 3		
1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
176.6	204.2	291	430	508.7	462.3	521.8	524.6	535.7	548.5	602.9	619.9	585

Table 8: Higher Education Enrollment by Fields, 1928–1940
(In Thousands)

	Plan 1				Plan 2					Plan 3			
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Engineering	52.3	62.8	130.3	197.3	233.4	188.3	198.8	193.9	175.6	170.5	194.6	201.5	176.8
Agriculture	26.9	34.0	44.7	57.5	62.2	54.2	61.3	63.5	58.5	53.3	62.5	56.6	45.7
Administration	16.5	18.3	21.7	30.7	34.3	38.2	31.1	30.8	29.5	30.1	26.8	27.7	22.5
Education	45.5	49.9	47.8	76.4	93.5	88.5	113.1	120.0	138.5	149.4	196.7	221.1	230.2
Health	25.6	26.1	27.6	32.1	46.4	47.7	61.4	76.3	85.3	91.2	109.9	113.0	109.8

In 1939 plan expansion peaked at a growth multiple of 3.5 times its 1928 base for an average annual increase of 22.8% over 11 years. Expansion proceeded most rapidly during Plan One. In 1928–32 enrollment increased 2.8 times for an average annual growth of 47% over four years. During Plan Two enrollment grew only 7% from the base of 1932, for an average annual growth of less than 1.5 percent. Of the 585,000 students in some 700 schools in 1940, 75,682 (12%) were in 29 universities.

With plan expansion the distinction between technical institutes and universities has all but disappeared. The European name is retained for universities, but the training they give is as narrow as that of institutes with emphasis on specialists in research and teaching. After 1931 university activity is reported statistically under Education. The dynamics of expansion shift away from the universities, away from individual schools, away from the distinction between institutes and universities. They focus on the five practical fields of level-3 schooling: Engineering, Agriculture, Administration, Education, and Health.

Two years powered Plan One's Bolshevik tempo: 1930 increased 42% over 1929; 1931 increased 42% on top of that. The slump of 1933, registering a 10% decline, introduced Plan Two, which never achieved more than two percent growth in any of its five years. The five fields accounted for over 95% of total Soviet tertiary population during the decade of Socialist Construction. In 1928 other fields, such as Communist Party schools, accounted for 5.5% of the total; in 1938 only two percent. After 1938 higher learning expansion entered a phase complicated by the introduction of massive extension enrollment and the approach of World War II (Table 8).

Engineering powered the heroic expansion of Plan One. In two years Bolshevik tempo tripled its enrollment, increasing its share of level-3 population from the leading 29% in 1928 to the dominating 45.8% in 1932.

Engineering's decline after 1932 was a major erosion factor creating the statistical plateau characteristic of Plan Two. In 1937, at the end of Plan Two, there were 62,900 less Engineering students in the system than in 1932.

In 1928 Education comprised 25% of the gross. By 1938 its growth multiple of 4.3 times its 1928 base pushed it past Engineering and increased its share of total population to the same level as Engineering, 32 percent. Education started late. While Engineering expanded 107% in 1930, Education declined five percent. The next year it registered a 59% increase. In the slump of 1933 it declined 6%, compared with Engineering's 20% loss. Henceforth it registered substantial increases year after year. Education's strong and continued expansion during Plan Two was the major factor offsetting Engineering's erosion of the aggregate.

Health was the principal support of Education for the maintenance of net enrollment expansion throughout Plan Two. In 1928 Health accounted for 14% of the gross. By 1938 it had multiplied 4.25 times and increased its share to 18 percent. Health's quantum jump of 44% over the previous year occurred in 1932, one year after Education's leap.

Agriculture displayed less dynamism than Health. In 1928 its student pool was slightly higher than Health's for 15% of the aggregate. Ten years later, Agriculture had multiplied 2.3 times and reduced its share of the gross to 10 percent.

Administration held the smallest share of the five fields and exhibited the least growth. Between 1928 and 1938 it expanded 62%, its share of the gross declining from 9.3% in 1928 to 4.4% in 1938. But it outperformed all other fields during the ma-

Table 9: Admissions Relative to Enrollments: Total, Engineering and Education, 1928–1940
(In Thousands)

	Plan 1				Plan 2						Plan 3		
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Total:													
Enrollment	176.6	204.2	291	430	508.7	462.3	521.8	524.6	535.7	548.5	602.9	619.9	585
Admissions	42.8	56.2	144.2	184.9	245.8	163.6	174.7	182.3	148.6	158.3	204.6	188.7	161.5
Engineering:													
Enrollment	52.3	62.8	130.3	197.3	233.4	188.3	198.8	193.9	175.6	170.5	194.6	201.5	176.8
Admissions	16.8	22.9	78.4	88.6	114.5	55.8	53.3	49.1	34.6	40.0	54.0	53.4	41.1
Education:													
Enrollment	45.5	49.9	47.8	76.4	93.5	88.5	113.1	120.0	138.5	149.4	196.7	221.1	230.2
Admissions	10.4	14.1	29.9	36.6	56.4	38.4	46.3	54.1	51.7	60.0	86.4	86.3	82.2

cro slump of 1933, registering an 11% increase and achieving its apex for the period of Socialist Construction.

Admissions were a major force in shaping enrollment dynamics (Table 9). 1930 was the year of the deluge in admissions, with an aggregate increment of 88,000. Engineering contributed 55,500 for 63% of the gross increase; Education, 15,800 for 17% of the whole. While Plan One admissions ran ahead of enrollment expansion, Plan Two admissions anticipated enrollment contraction. In 1933 the 44% slump in admissions triggered a 10% enrollment decrease. In 1936 a 19% decline in admissions slowed enrollment to a two percent rise. In 1933 82,200 fewer students were admitted to higher learning than in 1932. In the year of the macro slump, Engineering admissions fell off 18,000, 21% of the gross decline.

The ratio of admissions to enrollment is a major index to plan expansion dynamics. Admissions climbed from 24% of total enrollment in 1928 to 48% in 1932. At the start of Plan Two, admissions were 35% of total enrollment; they fell to 27% in 1936 before closing out the decade of Socialist Construction at 33% of enrollment in 1938. In 1935 Education admissions surpassed Engineering admissions for the first time. In 1938 the Education population overtook Engineering. Admissions and enrollments were roped together on the mountain, but they did not always climb in the same direction. In 1936, when macro admissions fell 19%, macro enrollments rose two percent. The most extreme case of admissions and enrollments disparity occurred in Education in 1930. That year Education admissions went up 122% over the previous year while Education enrollment went down 5%. Six years later in 1936, Education admissions were down five percent, enrollment up 15 percent. In 1940 the universities admitted 22,334 (26% of Education admissions), close to the number admitted to the universities in 1914 and 1925.

In contrast, graduations became a ripple effect at some years distance from admissions. From the data it is possible to construct the missing segments of reported population flow, students continuing from one year to the next (second, third, and fourth year), and students withdrawing prematurely from the system each year (Table 10). In 1932 admissions peaked at a multiple 5.7 times of 1928; in 1934 continuations achieved their apex at a level 2.8 times of 1928; in 1937 graduations reached maximum volume at 2.7 times of 1928. During this period withdrawals oscillated from unlikely zeroes to highs of 65% of admissions volume in 1932 and 86% of admissions volume in 1934. The continuation stream buffered the graduate pool from the fluctuations of admissions and withdrawals. Between 1928 and 1935 the proportion of next year's graduates in the continuing stream of a given year oscillated from a high of 48% in 1930 to a low of 15% in 1932. From 1936 on the percentage stabilized at 36% (1936) to 39% (1938). Fed by some 700 schools, the macro system was settling down to functioning as a 5-year program with the continuing stream containing roughly equal segments of the second, third, and fourth year classes.

From 1933 on it is possible to measure retention: graduate volume as a percentage of admissions' volume five years previously. In 1933 and 1934 graduate volume achieved an unlikely 80% and 87% retention rate of 1928 and 1929 admissions. From 1935 to 1940 graduates (admitted 1930–1935) registered a more plausible retention rate, fluctuating between the low of 42% of 1932 admissions graduating in 1937 to the 63% of 1933 admissions graduating in 1938. In 1939 the macro system produced almost as many dropouts (96,700) as graduates (98,300). Macro graduations jumped up

Table 10: Total Graduations Relative to Admissions, Continuations, and Withdrawals, 1928–1940
(In Thousands)

	Plan 1				Plan 2						Plan 3		
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Admissions	42.8	56.2	144.2	184.9	245.8	163.6	174.7	182.3	148.6	158.3	204.6	188.7	161.5
Continuations	105.1	115.1	102.9	195	219.7	264.1	297.9	238.6	289.5	285.4	294.5	332.9	322.7
Graduations	28.7	32.5	43.9	50.4	43.2	34.6	49.2	83.7	97.6	104.8	103.8	98.3	102.2
Withdrawals		24.9		117	166.8	80.6	150.3	33.8	47.9	45.4	67.9	96.7	

in 1935 with a 70% increase. The principal tributary of 1935's graduate flow was Engineering, since its graduations peaked at 4.1 times of 1928. Already 67% of admissions in 1931, Engineering withdrawals rose to a 73% rate in 1932. In 1939 more of its students (37,400) dropped out than graduated (28,400).

In contrast, Education graduates increased, maintaining with the aid of Health the macro system's high graduate plateau of 1936–1940. 1936 was the year of the quantum jump in Education graduations, a 72% increase over 1935. In 1935 Education as a whole stabilized as a four-year cycle with the graduate share of the continuing stream (second and third years) rising from 40% in 1935 to 54% in 1938.[25]. In 1941 the universities graduated 7,963 (19% of Education). Internal growth supplemented external growth as Education retention rates rose. The percentage of admissions for 1930–1932, graduating between 1934 and 1936, increased from 26 to 38 percent. More than 80% of the students admitted 1933–1934 graduated in 1937–1938.

While retention rates went up, the annual withdrawal rate fluctuated widely between 1937 and 1939, presenting another puzzle within the dynamics of Soviet statistics. But this much appears clear from the data available to this study: the dynamics of plan expansion sprang from broad admissions and broad withdrawals that produced a net rise in the continuing stream. Continuations appear generally stable after the massive withdrawals that seem to come mostly out of the first-year admissions stream.

The explosive growth in tertiary admissions outran the capacities of the secondary system. In the mid-1930s only about 15% of entering students came from regular secondary schools. By the late 1930s the secondary system had recovered its role as the academic filter for further education. By then at least one and possibly two 10-year-school graduates were available for each vacancy in the higher schools.

Plan expansion had considerable impact on the percentage of 17- (or 18-) year-olds admitted to higher schools from the total cohort (Table 11).[26] To move from a 1.3% to a 4.1% maximum of the age cohort admitted within two years, the government actively recruited workers, women, and non-Russians with varying success. Between 1928 and 1932 the number of students from the working class increased from 25.4% to the plan high of 58 percent.[27] Worker's faculties at the higher schools provided remedial secondary schooling. The proportion of women students increased from 28% in 1927 to 43% in 1937.[28] Non-Russians contributed to the swelling student stream. While the bulk of the growth came from Russia and the Ukraine, the Georgians increased from 10,500 students in 1928 to 16,500 in 1934; the Uzbekistans (not all Uzbeks) increased from 3,900 students in 1928 to 10,900 students in 1934.[29] Until the mid-1930s social recruitment quotas (more for workers and women than for peasants and Turks) had priority over academic standards. From the mid-1930s on, academic standards re-

25. Tables on Engineering and Education withdrawals are in Patrick L. Alston, "The Dynamics of Educational Expansion: Russia," presented to the Conference on Education and Social Change at the University of Missouri-Columbia, March 7–8, 1980.
26. Author's calculations and De Witt, 262.
27. Anweiler, 362.
28. Gail Warshofsky Lapidus, *Women in Soviet Society* (Berkeley, 1978), 149.
29. Jaan Pennar and Others, *Modernization and Diversity in Soviet Education* (New York, 1971), 350.

Table 11: Admissions and Age Cohort

Year	17-(or 18)	First Year Admissions	Maximum Percent
1914	3,326,940	20,000	.60
1925	3,308,000	22,000	.66
1928	3,400,000	43,000	1.3
1930	3,500,000	144,000	4.1
1940	3,200,000	155,000	4.7

turned to the place they had assumed in the 1870s. It took the Russian state 60 years to work its way through the social and political turbulence interfering with the extension of higher education to larger proportions of the total population (Table 12).[30]

Around 1930, while the nations they had once modeled their education upon sank into an economic depression overcome only by war, the Soviets achieved full employment. Henceforth tertiary admissions were in competition with the labor market for the annual crop of 15- and 17-year-olds. In 1940 France fell. Military manpower took precedence over school and factory. By 1942 student deferments were restored. In 1958 the manpower and fertility losses of the war (the census of 1958 calculated a birth deficit of 12 million) pitted higher education and the labor market head-on in the Khrushchev reforms. In the 1970s the Soviets achieved universal secondary education, and the political leadership has set higher admissions at 20% of secondary graduates.[31] Its judgment is answerable at the moment only to the next war.

30. Author's estimates.
31. The basic study for the dynamics of expansion and the connection between level 2 and level 3 in the 1970s is Wolfgang Mitter and Leonid Novikov, *Sekundarabschlüsse mit Hochschulreife im internationalen Vergleich* (Weinheim, 1976).

Table 12: Student and Total Population

	1859	1880	1897	1914	1926	1939
	61,648,000	97,705,000	125,640,000	166,347,000	147,027,000	170,467,000
University	5,000	8,045	15,000	69,000	40,000	75,682
Institute	3,750	7,110	15,000	58,000	128,000	544,218
Total	8,750	15,155	30,000	127,000	168,000	619,900
Total Number of Students Per 10,000 Population	1.4	1.5	2.4	7.6	11.4	36.3
Age Cohort 20-24	5,548,320	8,793,450	11,307,600	14,970,600	13,813,400	14,370,954
Students Percentage of Age Cohort	0.14	0.17	0.2	0.8	1.2	4.3

Colin B. Burke

The Expansion of American Higher Education

On the eve of the Great Depression American higher education was a tenuous part of the country's somewhat arbitrarily defined and bewildering system of supposedly egalitarian mass-education. This structure had evolved without true central direction or planning largely in response to the formalization of the country's social and economic life. The colleges and other higher schools were becoming integrated into the age based hierarchy of education that reformers had built over the previous 80 years, but higher education was not settled into a pattern of realistic commitment to universal and equal education and had only a facade of hierarchical integration. To contemporaries, however, the previous decades of reform appeared to have achieved most of their goals, a perception which was reinforced by the record of higher education's expansion in the 1920s. That decade's experience made it relatively easy to mistake growth for democratization and to attribute its causes to the now-famous reforms in the universities, the rise of technical schools and the apparent decline of the old ante-bellum laissez-faire approach to college founding.

Expansion and Equality:

By the most conservative estimates, the absolute number of students in the country's higher schools had doubled in less than ten years after World War I, and the share of the age group enrolled had increased by over one-half to one in eight young adults. If the enrollment increases had not been stopped by the Depression, America's colleges would have served almost the same percentage of the population in 1940 as they did in 1950. Less restricted definitions of college-level education in the late 19th and early 20th centuries not only placed at least one of every five young adults in "college" by 1929 but also highlighted the evolutionary nature of the expansion of post-secondary education. They indicate that the apparently unprecedented growth of enrollments in the 1920s was due to more than the abundance of the new age of industry and the spread of universal primary and secondary education.[1]

1. The themes underlying the historial interpretation of American higher education in the late 19th and early 20th centuries are surveyed in Colin B. Burke, *American Collegiate Populations* (New York, 1982).

Attendance had been expanding at appreciable rates for over 100 years. Although the increases in the standard of living in the 20th century and changes within colleges speeded the arrival of the burdens and rewards of higher education for a large segment of the population, the expansion and "democratization" of American higher education cannot be simplistically described or explained through deterministic or intentional arguments. Neither emphasis on the fulfillment of the immediate needs of industry and agriculture nor salutes to the triumph of functionalist thinking among educators are adequate.[2]

Changes within the educational system did aid enrollment growth. The cumulative effect of years of protest by educators and economic and social interest groups led to a wide set of curricular offerings from which students could choose in the 1920s. Training for the technical trades and other professions was available throughout the country in a variety of colleges and schools and even the curriculum for females had been altered to conform to modern rhetoric through the device of the ubiquitous but nebulous "home economics." The prestigious university, devoted to research and direct service to industry, was both a reality and an ideal which was being imitated by schools and colleges intended to be specialized but equal alternatives to traditional higher education. Most states supported highly publicized technical schools, but without much contemporary or historical notice the more numerically significant "streetcar" college, processing thousands of non-resident students, had developed in many cities, and the old normal schools were turning into the ill-defined "teacher's college." Many faculties were teaching any subject a handful of students might be willing to purchase through extension and correspondence divisions. To reduce all types of educational costs and to ease pressures on research institutions, many communities had returned to a new version of ante-bellum higher education, the local junior college and its circumscribed liberal arts course.

Moreover, the public sector had finally become numerically dominant. With subsidies from local, state, and national sources, public institutions offered what many considered an education equal to that of the finest private college or university at a much reduced cost to students. But the private colleges and universities remained important. Despite the need to maintain relatively high tuitions because of growing financial pressures, and while, in most instances, having fewer facilities than the state institutions, private universities and colleges continued to attract students. For reasons difficult to reconcile with theories of the economics of education or modernization, many parents and students chose the small four-year liberal arts college (so hated by educational reformers of the time) even though those schools could hardly afford the items supposedly necessary for modern education.

But the rise of public education did not mean that equality had been achieved. The responsiveness of the reformist educators, who shaped higher education after the Civil War to the wishes and, at times, demands of the new types of private and gov-

2. The "professionalism" and "industrialization" theses on the expansion of higher education were elaborated in Earle D. Ross, *Democracy's College: The Land Grant Movement in the Formative Stage* (Ames, Iowa, 1942); R. Freeman Butts and Lawrence A. Cremin, *A History of Education in American Culture* (New York, 1962); a useful review article which cites much of the newer work is James McLachlan's, "The American Colleges in the Nineteenth Century: Towards a Reappraisal," *Teacher's College Record,* 86 (1978), 287–306.

ernmental sponsors, did not create equal access to equal facilities either across the nation or within the states. The decades of rationalization and increased millions allotted to higher education led to a new type of educational politics. A struggle within public higher education displaced the old public-versus-private battle and generated conflict within a chaotic and perhaps hidden hierarchy of public higher education. Even as late as the 1920s, the result was inequality among curricula, types of institutions, and the states. The inequalities were caused by much more than remaining sexism or racism or the laissez-faire development of the higher schools. They were the outcome of the imbalanced power of interest groups, academic values and bargaining, and the complex histories of state educational systems.

Dynamics of Growth:

Unfortunately, the agency responsible for collecting and reporting statistical information on America's schools, the Office of the United States Commissioner of Education, used varying definitions of higher education, and its figures do contain ambiguities and typological errors. But its reports remain as the only viable source of information on higher education in the period after the Civil War. Prudent and careful use of the statistical information in the many volumes and their numerous tables makes it possible to trace the expansion of American higher education from the 1870s to the decade when America had unquestionably entered both the age of industry and mass consumption. Furthermore, a separate statistical series, compiled independently of the census and other government reports, allows the statistical estimates to be traced back to a period before the age of the machine and the rise of large-scale business or bureaucracy, the 1850s, and earlier, to the 1800s.[3]

As Table 1 illustrates, higher education began expanding before the transportation revolution, before industrialization, before full marketization and before the rush of professional regulation. It grew even before such inducements forged a mandatory link between formal education and careers and helped change higher education from a system of parallel institutions to a relatively covert hierarchy on top of the tiers of primary and secondary education.

Enrollments at colleges and professional schools increased twentysix-fold between 1800 and 1860 and attendance at the recognized male and coeducational colleges rose from approximately one to three percent of the white males age 18–21. Even the Civil War's social and economic impact did not halt the growth of the post-second-

3. This article emphasizes the standard interpretations as to be tested rather than as direct guides to conclusions. It is primarily based upon the *Reports of the United States Commissioner of Education* (for the period 1870–1930) and Colin B. Burke, *American Collegiate Populations* (for the 1800–1860 period). Both of these sources make it impossible to conform to traditional standards for citations and footnotes, since this would entail a series of notes which would take many more pages than the article itself. In the case of the 1870–1930 series, the tables in this article are the product of many tables for each decade, usually with different titles and formats each year, and many special reports found in the Commissioner's Reports and related series. In the case of the ante-bellum estimates, the thousands of sources used comprise many volumes of notes. Scholars with a need for further information may contact the author for detailed citations.

Table 1: College, University, Professional, Normal and Teacher College Enrollment: 1800–1930

Year	Number	% of White Males Age 18–21
1800	1,237	1.00
1810	2,562	1.50
1820	3,872	1.50
1830	7,822	2.40
1840	12,964	2.80
1850	17,556	2.30
1860	32,364	3.10
		% of White Males and Females Age 18–21
1870	62,000	2.30
1880	118,000	3.40
1890	157,000	3.50
1900	256,000	5.00
1910	355,000	5.60
1920	598,000	9.00
1928	1,174,400	15.00

ary schooling. Male enrollments, alone, grew by 40% and at least maintained the 1860 enrollment share (see Table 2). Against the force of the economic and social turmoil of the 1870s, the proportion of males in formal programs increased to one in 23 by 1880. The most startling increase came in the 1890s when there was a near doubling of the number of male students. By 1900, almost seven percent of the young men were in the higher schools. Growth continued during the next 20 years, but the 1890s increases were not matched for three decades. During the 1920s, the male enrollments once again increased by almost 100%, and the attendance in 1930 meant that approximately one of every seven young men in the United States was in a regular program in the country's universities, colleges, teacher training institutions or professional schools. The addition of females to both the college enrollments and the base population after 1860 (see Table 1) does alter absolute numbers but not the general trends.

For the most part, enrollment expansion managed to survive decades of recession and depression, but it usually flourished during prosperity. It appears, however, that economic swings had an impact on life plans and resources affecting enrollments in later years. Enrollments did tend to parallel the growth of the percentage of the population finishing high school. But the record of different curricula must be examined to understand the causes and meaning of the growth of the post-secondary sector. Hence the series presented in Tables 1 and 2 need to be revised in order to grasp the extent to which higher education had become a part of the life course of America's youth.

Technical and agricultural education were not significant causes of the expansion of enrollments in any period. The rise of technical schools and the spread of engi-

Table 2: Various Male Enrollments by Type of Institution: 1800–1930
(Absolute Numbers and as Percent of Total Male Enrollment)

Year		Colleges/ Universities	Professional** Schools/Departments	Normal/ Teacher Colleges
1800	N	1,156	81	--
	%	93	7	
1810	N	1,939	623	--
	%	76	24	--
1820	N	2,566	1,306	--
	%	66	34	--
1830	N	4,647	3,175	--
	%	59	41	
1840	N	8,328	4,636	--
	%	64	36	
1850	N	9,931	7,625	--
	%	57	43	
1860	N	16,600	14,164	2,000*
	%	51	44	6
1870	N	23,000	12,000	5,000*
	%	58	30	12
1880	N	34,600	22,382	20,000*
	%	48	30	23
1890	N	46,220	32,000	18,000*
	%	48	33	19
1900	N	72,159	58,000	48,000*
	%	41	33	27
1910	N	119,578	66,000	38,000
	%	54	30	17
1920	N	208,686	67,000	29,000
	%	68	22	10
1928	N	427,762	93,639	61,573
	%	73	16	11

*Indicates Estimate
**("All Professional" includes all medical, theological and law students)

neering courses after the Civil War cannot account for the increased attendance. As late as 1927/28, less than seven percent of the students in the recognized colleges and schools were enrolled in any type of engineering program. The much publicized and

highly subsidized agricultural schools suffered from even more neglect. Few young men or women chose to pursue their careers through formal training in agriculture. Just before the Great Depression approximately one percent of the students in the recognized institutions were enrolled in those programs. The "technical" schools, which were established after the Civil War and which had many students who did not take either practical or scientific courses, also had a relatively poor record. They never accounted for more than six percent of total attendance down to their disappearance as a separate statistical category in the Commissioner's Reports.

The record of expansion in various curricula and types of schools requires an explanation more complex than "industrialization." Male attendance trends suggest that growth was due to more general social and economic changes. Also, the belief that professionalization, at least within the traditional occupations of law, medicine and theology, caused expansion is only partially correct. Enrollments in professional schools actually declined as a percentage of enrollments in the colleges and universities. The estimates in Table 2 are, in fact, an overstatement of the numbers of men in the professional schools in the 20th century because of the increased number of years required for certification in law and medicine. Due to the escalation of professional-school training time, a comparison of 1860, and perhaps 1880, with later decades should be based upon a reduction of the numbers and percentages in professional schools. Because necessary years of medical training had changed from one in 1860 to four in 1930 while law went from one or two to at least three, the numbers of different students contacted by the schools and the percentage of total male enrollments should be reduced. Using a divisor of three, the estimates for 1927/28 deflate to the absolute levels of the 1880s and the share of the relevant population is reduced to that of the 1870s. Furthermore, attendance at the professional schools became a smaller and smaller proportion of total male attendance. If formal training for the law had not increased from some 13,000 in 1890 to approximately 50,000 in 1930, professional training would have become a numerically insignificant part of the higher educational system.

The growth of male enrollments in undergraduate programs in the regular colleges and universities was significant, but not as easily explained as the trends in the traditional professions. Professional enrollments were conditioned by the direct and indirect costs of training and increasingly restrictive entrance policies reflecting political actions by professional groups and educators. Undergraduate attendance was stimulated by rising demands for pre-professional education and the growing number of job-related courses in the schools such as commercial and business training. But it is difficult to account for the increased enrollments, especially of young men, through a strengthened tie between the colleges and the old professions. Whatever the causes, the record of men's attendance at the regular colleges is startling and does explain why the 1920s were perceived as so revolutionary by educators.

As a percentage of white males ages 18 through 21, male undergraduate enrollments in the regular colleges and universities remained relatively stable from the Civil War to 1890, although absolute numbers more than doubled. The 1890s witnessed not only another near doubling but a 50% increase of the proportion of young men in undergraduate programs. Even more puzzling was the increase in the 1910s when the proportion grew by 65 percent. This jump was matched in the 1920s leading to the attendance of 11% of America's young men in the regular institutions, despite

the high percentage of foreign born. As with the general trends in male enrollments, the immediate reasons for the increases after 1900 are difficult to identify.

The inclusion of women in the higher educational system and the rise of formalized training for the new "profession" of teaching were the two most significant causes of this expansion. The sudden increase in total attendance in 1870 (Table 1) is somewhat of an artifact: a result of a shift in the inclusiveness of the category "higher education." From 1870 on, the Commissioner's Reports included, with ever-shifting criteria, women's colleges while more and more formerly male institutions merged with associated women's colleges and others finally opened their doors to females. Before the beginning of the 20th century approximately one-third of America's college students were female and they comprised almost one-half of all enrollments because of their domination of schools for teachers.

The other major attraction of higher education after the Civil War was teacher education. The exclusion of normal schools and teachers colleges from the Commissioner's series does not eliminate the importance of the professionalization of education to the colleges. Within the regular institutions a significant proportion of students in all postbellum decades were enrolled in both teacher training programs and teacher's courses. For the late 19th century an estimate of 30% of the students seems acceptable and in 1927/28 a minimum of 30% (perhaps as much as 40%) of the students in the regular colleges and universities were involved in teacher training.

The statistical estimates usually presented, such as those in Tables 1 through 4, understate the growing importance of institutionalized education during the 19th and 20th centuries and tend to impose the view that the recognized colleges had maximized enrollments and had led adjustments to a formalized economy and society. Not only was "higher education" more attractive, if not necessary, than such series imply, but institutions and methods outside of the regular system may well have supplied models of education for the recognized colleges and provided the most direct links between industry, business, and the common men and women of America.

The enrollment figures shown above contain at least two downward biases. Each distorts the nature and importance of "higher" education. The first is related to the development of standardized life progressions for America's youth and the accompanying emergence of the country's primary and secondary systems, but it will remain uncorrected until scholars have time to study the age distributions in American schools. During the ante-bellum period it was common for colleges to admit students whose ages ranged from 15 to 30. There was a decided trend during the era toward the modern standard of the 18- to 21-year-old span, but the age of students varied from college to college. Although a few leading schools of the postbellum period have been studied, there is not yet enough information to detail how changes in family patterns, local economies, and the crystallization of lower education affected all types of schools and the various regions. (An informed guess is that the estimated enrollment percentage for the 20th century, compared to 1850 or 1860, should be raised by at least one-fifth.)[4]

4. For an example of the studies of age distributions during ante-bellum era, see Colin B. Burke, *American Collegiate Populations,* Chp. 3. On the later period see, W. Scott Thomas, "Changes in the Age of College Graduation," *Popular Science Monthly,* 3 (1903), 159–171.

Table 3: Female Enrollments: 1870-1928
(As a Percentage of Total Enrollments)

	Colleges, Universities, Normal, Teacher and Professional Schools	Colleges, Universities, Normal and Teacher Schools only	Colleges, Universities and Professional Schools
1870	28	34	--
1880	35	43	--
1890	39	48	31
1900	31	39	35
1910	37	45	35
1920	38	44	38
1928	49	53	42

Table 4: Normal School and Teacher College Enrollment
(As a Percentage of Total Enrollment)

	In all Colleges, Universities, Teacher, Normal and Professional Schools	In all Colleges, Universities, Teacher, and Normal Schools only
1870	16	20
1880	35	43
1890	29	36
1900	30	38
1910	37	46
1920	27	31
1928	25	28

The second bias in the usual time-series was caused by the exclusion from the reports of the alternatives to the regular colleges, normal and professional schools and teachers colleges. America had a host of commercial and correspondence schools which served numbers of students equalling those in the more "respectable" institutions and unknown numbers of adults who attended business sponsored seminars and training programs. Commercial schools, teaching specific skills for lower white-collar occupations and specialized tasks such as telegraphy, had begun to appear well before 1860. Not usually included in the national statistical reports until the late 19th century, these institutions accounted for approximately one of four students in higher education in the 1870s, one of three in the 1890s and one in six in 1927/28. Although many of their students were young and many probably had not bothered or been able to structure their lives in order to progress through the measured steps of the new secondary system, these mercurial schools did provide a form of "higher" education which was attractive and accessible to a significant number of America's young. When the public and private colleges copied their methods and curricula in the 20th century, they contributed to a decline of private commercial education in the 1920s.

Table 5: Enrollments in States, 1927-8
(As Percent of the White Population Age 18-21 [W] and Total Population Age 18-21 [T])

STATE	Colleges, Universities, Professional, Normal and Teachers Colleges		Public Universities and Colleges	Private Universities and Colleges	Normal Schools and Teachers Colleges	Total Enrollment in State as Percent of U.S. Total Enrollment
	(W)	(T)	(W)	(W)	(W)	(W)
AL	13	8	4	3	6	1.5
MS	12	6	5	5	2	0.8
TN	13	12	2	6	5	2.2
KY	7	6	2	5	0	1.0
FL	7	5	5	2	0	0.5
GA	14	8	4	8	2	1.5
SC	16	8	8	6	2	1.0
NC	13	9	3	6	4	1.9
WV	11	10	4	2	5	1.1
VA	17	12	4	7	6	1.9
DC	64	44	0	64	0	1.2
MD	16	13	3	11	2	1.2
DE	5	4	5	0	0	0.1
AR	8	6	3	3	2	0.7
LA	13	8	4	6	3	1.1
OR	16	15	6	2	8	1.2
TX	15	13	4	6	5	5.0
MO	15	15	3	8	5	3.1
ND	17	17	6	1	10	0.8
SD	16	16	5	4	7	0.7
NB	20	19	8	6	6	1.6
KA	21	20	8	6	7	2.2
IA	17	17	7	7	3	2.4
IN	14	13	4	7	3	2.1
WI	15	15	5	4	6	2.5
MN	15	15	8	5	2	2.3
MI	13	12	5	3	5	3.4
OH	16	15	7	7	2	5.7
IL	17	16	4	10	3	6.9
ID	16	16	7	4	5	0.4
MT	11	11	7	1	3	0.4
WY	9	9	9	0	1	0.1
CO	21	21	7	6	8	1.3
NM	9	9	5	0	4	0.2
AZ	14	13	8	1	6	0.4
UT	17	17	11	6	0	0.2
NV	18	18	18	0	0	0.1
WA	17	17	11	2	4	1.5
OR	21	21	11	6	4	1.1
CA	19	19	8	8	3	5.6
ME	11	11	3	3	5	0.5
VT	11	11	5	5	1	0.2
RI	9	9	1	6	2	0.3
NH	19	19	6	9	4	0.4
MA	19	19	1	18	1	4.5
CT	7	7	1	6	1	0.6
NJ	5	5	2	2	1	1.2
NY	17	17	4	12	1	12.1
PA	12	12	1	9	2	6.8

Another alternative, one that seemed to be able to accomplish what many reform-minded educators in mainstream institutions could not do, was study-by-mail. Although many of the regular colleges, and even some seminaries, had engaged in correspondence instruction before the 20th century, private and semi-private companies took the lead in attracting students and developing and maintaining courses which were suited for the teaching of skills needed in business, the trades, and industry. Private firms, such as the one which became ICS, as well as those associated with colleges (the American School) shared a large-but-as-yet unknown market with the correspondence programs of the regular colleges. Very broad estimates are all that are possible, but at the beginning of the 20th century private correspondence schools enrolled, at a minimum, 100,000, and in the same period the regular colleges perhaps serviced another 50,000. By the late 1920s, the recognized institutions had some 100,000 and the major private firms probably served at least twice that number of "students-by-mail."

A third neglected part of higher education, overlooked because of its "irregularity" during a period when educators were searching for status and stability, also raises the estimates of young Americans in higher education. Both public and private colleges and universities had established extension divisions by 1900 and continued to expand these programs during the 30 years before the Crash. In 1927/28, some 220,000 people were involved in these sincere, if not well-funded, attempts to make higher education flexible, job-related and geographically and financially accessible.

These additions to enrollments in the recognized institutions and programs suggest that well over 20% of the adults of the 1920s were "attending" some form of higher education just before the Depression.

Causes of Growth:

Enrollments, however impressive, are not true indicators of the success of the colleges and universities in reaching out to the common man. Much of the expansion of attendance was due to general socio-economic change which reduced options for career pathways rather than changes internal to educational institutions. The standardization of tasks and techniques in white-collar occupations and increased certification requirements in education and other new pseudo-professions, as well as increased wealth in the country, rather than inherently attractive innovations by educators, explain much of the growth. Thus the most respected and technically advanced types of colleges and universities continued to service students from the upper and upper-middle classes during the 1920s. If the increasing levels of public subsidization were at all successful in democratizing higher education, the results are to be found in the usually underfunded normal and teacher's colleges, not in the well-supported "technical" universities. If the private colleges remained in contact with the sons and daughters of the average family, it was through the rural and old-fashioned liberal arts college and the lower-status urban college rather than the modern multiversity.[5]

5. On the question of trends in the socio-economic backgrounds of college students over the period see Colin B. Burke, *American Collegiate Populations*, Chps. 4 and 5.

The expansion of enrollments and the supposed democratization of the student population compared to the ante-bellum era are sometimes pictured as being caused by a movement towards efficiency in higher education. In particular, the eighteen-fold increase in enrollments between 1870 and 1930 has been seen as the result of the development of large multipurpose institutions and the elimination of numerous small, inflexible, and unstable "old-time" colleges. However, not only are the typical estimates of 560 colleges and professional schools in 1870 and only 1400 in 1930 deceptive, but the instability of the small colleges may well have been overstated. The large and supposedly efficient new colleges and universities were really conglomerations of previously separate schools. It is unclear whether these moves toward administrative consolidation truly brought efficiency and stability and an unfinished study of the longevity of the colleges from the Civil War to the 1930s indicates that much of the seeming turmoil of the period was the result of general social change, such as the demise of separate institutions for females, rather than of irrational decisions by educators, towns, or religious denominations. Available statistical data on medical and legal education show that the closing of medical schools (over 80 or one-half disappeared between 1900 and 1930) neither increased attendance or democratized their student populations while the increase in the number of law schools, especially night and part-time ones, was accompanied by phenomenal enrollment expansion.[6]

Results of Expansion:

The result of this enrollment growth was not equality or equity. Not only did states and regions differ in the percentage of students enrolled, but within any area students were exposed to varying levels of costs, quality, and opportunities for higher education. Deriving from more than the ratio of private to public education, the inequalities, and perhaps the expansion, were the consequence of a disorganized system which was overlaid with only an apparent rationality.

America always had state and regional differences in enrollment levels, the number and types of institutions, and the balance between public and private schools. Although reform movements had eliminated many disparities after the Civil War, the 1920s ended with important remaining differences in the distribution of education. Enrollments within the various states are an example. There were always "centers" of higher education where both within-state enrollments and in-migration led to a few areas having very impressive student-to-population balances. Massachusetts and Washington, D.C. had long histories of attracting students from across the country if not from within their borders. Other states had very low rates of college-going by their own young or out-of-state students. Such patterns continued through the Depression and the popularity of types of higher education varied from region to region and even from state to state (Table 6).

The variations in enrollments are difficult to explain through such obvious factors as the proportion of growth in secondary education, the wealth or the general econ-

6. A study currently undertaken by this author traces the longevity of all colleges and higher schools in the United States from 1800 to the 1950s and specifies what happened to those institutions in the statistical context of higher education in each school's immediate area.

Table 6: Number of Public and Private Universities, Colleges, Professional Schools, State, Normal and Teachers Colleges, 1927-1928

State	Public	Private	Normal	Teachers
AL	3	10	7	0
MS	4	14	1	2
TN	2	30	0	5
KY	2	26	1	4
FL	2	4	0	0
GA	7	26	3	3
SC	6	16	0	1
NC	4	29	3	4
WV	4	9	4	3
VA	5	27	0	6
DC	0	11	0	0
MD	1	16	4	0
DE	1	0	0	0
AR	4	13	1	1
LA	3	8	1	1
OK	9	8	0	7
TX	21	46	0	9
MO	7	45	0	7
ND	4	1	1	0
SD	3	8	0	4
NB	3	15	0	4
KA	12	23	0	3
IA	14	31	0	1
IN	2	24	0	4
WI	1	15	-	10
MN	7	22	1	5
MI	12	17	0	5
OH	6	51	0	3
ID	2	2	2	0
MT	2	2	0	2
WY	1	0	0	0
CO	5	7	0	3
NM	4	0	1	2
AZ	2	1	0	2
UT	2	5	0	0
NV	1	0	0	0
WA	4	6	3	0
OR	2	12	2	0
CA	31	37	0	7
ME	1	4	5	0
VT	1	3	1	0
RI	1	2	0	1
NH	1	2	1	1
MA	1	30	5	5
CT	1	8	4	0
NJ	2	13	4	1
NY	3	58	9	2
PA	2	69	3	11

Table 7: Students Enrolled in Recognized Colleges, Universities and Professional Schools: 1927–28
(In Percentages, by Subject)
(Upper Entry = Public, Lower Entry = Private)

State	MEDICAL	LAW	DENTAL	PHARMACY	THEOLOGICAL	COMMERCIAL	HOME ECONOMICS	ENGINEERING	TEACHERS	ART	AGRICULTURE
AL	2	2	0	0	0	9	6	20	13	45	1
	0	0	0	0	*	1	1	0	4	77	0
MS	2	2	0	1	0	6	7	17	7	49	14
	0	0	0	0	0	0	0	1	0	99	0
TN	11	13	0	3	0	10	9	13	17	35	6
	4	2	1	1	0	*	1	1	2	79	0
KY	7	4	2	0	0	6	3	13	6	46	3
	0	3	0	2	13	0	*	0	5	75	0
FL	0	8	0	2	0	10	3	9	27	35	3
	0	6	0	0	0	5	0	1	7	61	0
GA	2	3	0	*	0	11	28	24	1	29	2
	3	4	4	1	6	3	1	0	4	72	0
SC	3	1	0	1	0	6	3	12	6	52	7
	0	*	0	2	0	0	0	0	0	87	0
NC	1	3	0	1	0	16	2	15	10	40	3
	1	1	0	1	1	2	2	0	3	84	0
WV	3	4	0	1	0	2	9	10	7	55	4
	0	0	0	0	0	0	0	0	6	94	0
VA	11	5	2	2	0	8	*	26	3	44	2
	0	3	0	0	3	5	*	1	1	82	0
DC	–	–	–	–	–	–	–	–	–	–	–
	7	16	1	1	2	1	*	4	9	39	0
MD	15	11	14	13	0	0	0	9	5	21	4
	*	0	0	0	3	1	1	3	17	57	0
DE	0	0	0	0	0	0	7	19	13	52	3
	–	–	–	–	–	–	–	–	–	–	–
AR	6	1	0	0	0	2	4	16	21	45	5
	0	0	0	1	3	2	2	0	2	81	0

Table 7 (continued)

State	MEDICAL	LAW	DENTAL	PHARMACY	THEOLOGICAL	COMMERCIAL	HOME ECON	ENGINEERING	TEACHERS	ART	AGRICULTURE
LA	0	2	0	0	0	5	6	17	19	39	5
	8	5	2	2	0	0	0	10	0	55	0
OK	2	3	0	1	0	7	4	14	6	52	3
	0	3	0	0	4	0	0	0	5	46	0
TX	2	2	0	*	0	3	3	15	3	62	5
	2	1	1	*	3	3	*	3	7	79	0
MO	1	2	0	0	0	3	1	15	7	54	4
	5	4	5	2	6	5	*	3	1	53	0
ND	2	2	0	3	0	7	5	19	18	36	5
	0	0	0	0	0	0	0	0	0	81	0
SD	2	3	0	3	0	0	5	25	*	48	5
	0	0	0	0	0	0	0	0	5	82	0
NB	4	2	1	2	0	11	4	11	19	26	3
	3	4	3	3	1	8	0	0	10	61	0
KA	2	1	0	1	0	5	5	16	2	51	4
	0	2	0	0	2	0	*	0	0	82	0
IA	4	2	2	1	0	4	10	15	1	37	5
	0	1	0	*	2	3	1	1	5	76	*
IN	5	4	2	1	0	2	6	23	4	28	4
	0	2	0	2	2	7	*	7	8	71	*
WI	3	3	0	1	0	2	3	10	2	56	3
	5	3	3	0	4	9	1	7	0	51	0
MN	5	2	2	1	0	3	4	13	13	45	2
	0	6	0	0	7	2	0	0	1	82	0
MI	6	4	2	1	0	2	2	13	*	47	2
	0	13	0	0	2	11	2	9	1	50	0
OH	2	2	1	1	0	9	2	12	16	22	2
	1	4	1	2	2	2	*	4	12	52	0
ID	0	1	0	1	0	17	4	14	18	28	5
	0	0	0	0	0	0	0	0	0	100	0
MT	0	0	0	2	0	0	0	21	1	33	5
	0	0	0	0	0	0	0	0	0	100	0
WY	0	2	0	0	0	11	4	13	19	29	5
	-	-	-	-	-	-	-	-	-	-	-
CO	4	2	0	1	0	1	5	23	0	44	4
	0	6	3	1	2	25	5	5	0	55	0

Table 7 (continued)

State	MEDICAL	LAW	DENTAL	PHARMACY	THEOLOGICAL	COMMERCIAL	HOME ECONOMICS	ENGINEERING	TEACHERS	ART	AGRICULTURE
NM	0	0	0	0	0	4	4	22	0	37	3
	-	-	-	-	-	-	-	-	-	-	-
AZ	6	1	0	0	0	2	4	16	21	45	5
	0	0	0	0	0	0	0	0	0	100	0
UT	1	1	0	1	0	16	3	11	12	33	4
	0	0	0	0	0	13	2	1	23	28	2
NV	0	0	0	0	0	0	3	18	5	64	3
	-	-	-	-	-	-	-	-	-	-	-
WA	0	2	0	2	0	11	3	11	5	59	2
	0	4	0	0	0	4	1	0	0	63	0
OR	3	1	0	3	0	22	7	11	10	21	5
	0	14	11	3	10	0	0	0	0	49	0
CA	1	1	1	1	0	5	1	5	11	66	1
	3	8	2	1	2	4	0	4	1	43	0
MW	0	0	0	0	0	0	5	33	1	40	6
	0	0	0	0	2	0	0	0	0	98	0
VT	11	0	0	0	0	0	7	12	0	91	3
	0	0	0	0	0	0	0	13	0	85	0
RI	0	0	0	0	0	16	17	40	0	18	4
	0	0	0	0	0	0	0	6	0	83	0
NH	0	0	0	0	0	8	5	23	0	54	6
	2	0	0	0	*	4	0	1	0	97	0
MA	0	0	0	0	0	0	0	26	0	0	67
	3	15	1	1	2	5	0	8	6	31	0
CT	0	0	0	0	0	0	17	12	8	0	63
	3	5	0	0	7	0	0	10	0	67	0
NJ	0	0	0	8	0	0	2	11	*	36	2
	0	40	0	0	15	0	0	13	1	74	0
NY	0	0	0	0	0	12	0	1	2	52	0
	3	11	1	3	2	11	1	6	11	33	1
PA	0	0	0	0	0	10	3	33	11	17	14
	3	3	2	2	2	14	1	6	10	34	0

Table 7 (continued)

Public and Private College Share of Enrollment in the Programs - In Percent

Pub.	39	17	28	40	0	38	78	64	47	39	89
Priv.	61	83	72	60	100	62	22	36	53	61	11

Coefficient of Variance for State Distributions of Percentage of Students Enrolled in the Various Programs

	Public	Private
Medical	1.83	3.19
Law	1.17	1.79
Dental	2.46	2.44
Pharmacy	1.63	1.54
Theological	0	1.38
Commercial	0.89	1.53
Home Econ.	1.12	1.37
Engineering	0.42	1.28
Teachers	0.89	1.29
Art & Science	0.39	0.30
Agriculture	1.87	3.80

* Indicates .5%

omies of areas or even the availability of programs within the colleges. The balance between public and private institutions has unexpectedly low explanatory power as does the presence of the new multiversity. While all of these factors will contribute to a quantitative exploration, as will the regional cultures and the proportions of the foreign born and minorities, none stands out as dominant single-factor explanation. A similar interpretative problem is posed by state-level variations in the choice of curricula by students.

It is somewhat less difficult to find reasons for the inequalities among the institutions within a region or within the public or private domains. Regional wealth levels seem to have played a role and the monies available to the various denominations conditioned the resources held by their colleges. Also, governmental policies, directly influenced by interest groups such as business and agriculture, and the general values placed upon certain types of public education set the costs and quality of higher schooling.

Tables 8 and 9 present some of the variations of costs and resources among types of institutions and areas. Other evidence suggests similar inequalities among pro-

grams within colleges. (Agriculture departments, in 1927/28, listed about four students per faculty member while the liberal arts teacher carried close to 30.) By the 1920s, there was a hierarchy within higher education—increased public control did not result in equality. The new public educators allowed and perhaps encouraged an unequal distribution of costs and resources. The public "university" in most states

Table 8: Range of Average Tuition/Fees and Capital Values per Student, for Types of Public Institutions by States, 1927-28
(In Current Dollars)

State	Average Tuition/Fees per Student			Average Capital Value per Student		
	Public Universities, Colleges, Professional Schools and Technical Schools	Public Normal Schools	Public Teachers Colleges	Public Universities, Colleges, Professional Schools and Technical Schools	Public Normal Schools	Public Teachers Colleges
AL	68	12	-	116	-	25
	72	81	-	318	-	276
MS	27	37	27	144	133	166
	83	-	-	460	-	-
TN	15	-	31	42	-	54
	72	-	-	382	-	-
KY	52	4	19	250	7	60
	-	-	-	-	-	-
FL	44	-	-	227	-	-
	45	-	-	1,133	-	-
GA	0	18	3	75	105	11
	91	-	-	510	-	122
SC	0	-	16	292	-	177
	21	-	-	366	-	-
NC	44	6	12	68	34	170
	80	30	-	488	65	-
WV	2	-	19	-	-	34
	-	-	-	-	-	-
VA	60	-	23	211	-	126
	123	-	-	241	-	-
MD	193	-	-	350	48	-
	-	-	-	-	1,250	-
DE	93	-	-	921	-	-
	-	-	-	-	-	-
AR	10	34	26	21	117	43
	37	-	-	375	-	-
LA	15	3	13	81	185	43
	38	-	-	364	-	-
OK	0	-	12	58	-	42
	76	-	-	251	-	-

Table 8 (continued)

TX	29	–	18	121	–	61
	35	–	–	476	–	–
MO	71	–	28	546	–	65
	–	–	–	–	–	–
ND	–	20	31	–	133	124
	–	–	–	–	–	–
SD	49	–	29	273	–	126
	57	–	–	1,002	–	–
NB	52	–	14	294	–	109
	–	–	–	–	–	–
KA	71	–	42	141	–	85
	72	–	–	510	–	–
IA	73	–	45	620	–	75
	85	–	–	661	–	–
IN	31	–	42	285	–	74
	80	–	–	424	–	–
WI	68	–	7	473	–	165
	–	–	–	–	–	–
MN	62	13	12	360	123	60
	–	–	–	–	–	–
MI	26	–	8	409	–	74
	98	–	–	1,794	–	–
OH	28	–	20	56	–	62
	58	–	–	312	–	–
IL	62	–	21	399	–	71
	–	–	–	–	–	–
ID	16	9	–	319	100	–
	50	10	–	514	105	–
MT	37	29	–	244	49	–
	42	47	–	478	66	–
WY	35	–	–	395	–	–
	–	–	–	–	–	–
CO	92	–	26	405	–	117
	115	–	–	1,216	–	–
NM	23	10	26	578	103	74
	48	–	–	723	–	–
AZ	–	–	3	–	–	204
	–	–	–	–	–	–
UT	41	–	–	269	–	–
	–	–	–	–	–	–
NV	43	–	–	353	–	–
	–	–	–	–	–	–

Table 8 (continued)

WA	40	39	-	226	84	-
	68	51	-	302	141	-
OR	63	13	12	252	25	42
	66	16	-	409	56	-
CA	53	-	4	351	-	64
	-	-	-	-	-	-
ME	126	0	0	369	16	13
	-	-	-	-	25	-
VT	229	-	-	292	-	-
	-	-	-	-	-	-
NH	105	18	44	256	60	281
	-	-	-	-	-	-
MA	56	7	5	1,139	61	52
	-	10	-	-	105	-
CT	75	0	-	128	70	-
	138	0	-	1,325	206	-
RI	25	-	10	526	-	141
	-	-	-	-	-	-
NJ	142	0	0	610	61	64
	-	-	-	-	178	-
NY	8	0	0	29	30	58
	121	-	-	647	93	-
PA	103	12	33	84	205	144
	-	72	-	434	475	-

had a decided advantage over the public junior college, teachers college, and normal school. And in states with more than one major public institution, there were usually great differences among campuses. The federal subsidies for agricultural and engineering education had a major impact on institutional profiles, as did public educational politics within the states (including remaining racism), as indicated by the cost and equipment profiles for colleges of the same general type. Finally, the demise of cooperation between the states and private higher education, beginning with more liberal interpretations of the Constitution in the 19th century, meant that non-public education was facing increasing difficulties in financing itself. Perhaps in some areas, this lead to fewer options for American students to select the type of institution and educational community they desired.

At the beginning of the Great Depression, America had a varied set of higher schools which were only beginning to face the problems and potentials of mass higher education. This almost "non-system" was by no means equitable and the shift to public sponsorship and direction had not solved problems of democratic access to equal educational facilities. The shape of higher education was partially due to continued dependence upon state-level funding and direction and the division of control and financing into separate spheres for types of institutions. But it also mirrored the federal government's commitment during the 19th and 20th centuries to sponsor economic growth according to one particular view of its causes, technical training. Aca-

Table 9: Range of Tuition and Fees and Capital Values for Students in Private Colleges, Universities and Professional Schools, 1927-28

State	Tuition and Fees per Student	Capital Value per Student
AL	42	35
	131	195
MS	44	72
	89	193
TN	73	132
	339	260
KY	21	111
	142	269
FL	109	81
	173	132
GA	56	111
	157	235
SC	53	39
	62	57
NC	78	69
	116	70
WV	65	153
	90	-
VA	100	87
	111	246
DE	113	53
	168	149
MO	238	140
	259	483
AR	94	140
	159	163
LA	124	73
	149	391
OK	86	53
	123	70
TX	127	131
	129	174
MO	124	55
	182	212
ND	89	167
	-	-
SD	75	58
	144	83

Table 9 (continued)

State	Tuition and Fees per Student	Capital Value per Student
NB	131	194
	163	561
KA	91	71
	166	281
IA	164	103
	173	299
IN	117	65
	141	297
WI	119	211
	213	241
MN	130	220
	217	404
MI	47	190
	174	1,219
OH	64	94
	167	276
IL	122	88
	206	128
ID	67	48
	68	57
MT	98	93
	117	549
WY	-	-
CO	77	75
	131	281
NM	-	-
AZ	35	87
UT	45	145
	67	209
NV	-	-
WA	56	170
	148	275
OR	71	125
	124	274
CA	180	423
	317	792
ME	243	64
	257	931

Table 9 (continued)

State	Tuition and Fees per Student	Capital Value per Student
VT	98	280
	182	400
RI	324	-
NH	354	249
MA	71	20
	118	30
CT	209	782
	280	2,371
NJ	133	-
	199	54
NY	205	190
	294	251
PA	89	144
	153	637

demic values also played a role by allowing such disparities to arise and continue. The decision by the governments to aid "technical" education rather than students in general, and academic politics, which reinforced such policies, had a profound effect on the quality of education for those who sought training outside of subjects which seemed to have the most direct relation to economic development and the prestige of academicians. The education of teachers, for example, was perceived as needing only minimal funding per student and the struggling young man or woman in a "streetcar" college was subjected to an institution which might be able to fulfill minimal requirements for certification but which was unlikely to make an independent contribution to social mobility or to turn attendance from an exercise in educational "efficiency" to a meaningful life experience. The $27-per-student value of library and equipment at CCNY during the 1920s, compared to the some $600 value at New York's School of Forestry suggests that the promise of egalitarian, even democratic, education was difficult to realize within the context of America's economy and educational politics.

The continuation of a system with diffused power, even within subsystems such as state teachers colleges, meant that America's institutional profile remained as unique and fluid as it had been before the Civil War. Specialized institutions could quickly change into general colleges attempting to fulfill the same functions as the most highly-endowed universities; one institution within a system could manage to acquire resources far beyond those given to an "equal" institution; and faculties could subvert the original intentions of institutional founders and change their role from one of the distribution of knowledge to the widest possible audience to the creation of new knowledge with all the elitist consequences which come with research oriented insti-

tutions. But it probably was the lack of organization and uniformity in the American higher educational system which allowed it to attract as many students from different social backgrounds and with such different occupational and cultural goals as it did. Policies in the public sector, the failure of academics to control their own system, and the continued public-versus-private struggles forced and allowed the colleges to "play to their market" and led many to become competitors within a system that had supposedly been restructured to eliminate the instabilities caused by competition.

Part Two: The Diversification of Institutions

Sheldon Rothblatt

The Diversification of Higher Education in England*

A little more than a century ago the higher education of England began the transformation that in time produced the pre-eminence in national life ascribed to it by Harold Perkin in this volume. New universities, colleges, technology schools, and government-funded research organizations were established. Whole new areas of knowledge, scarcely known in 1860 or known only in embryonic form, were introduced, first gradually and then, about 1880 or 1900, much more rapidly. Disciplines and sub-disciplines acquired the autonomy they now enjoy as professional careers, although not overnight, not at the same pace and not with the same degree of recognition in each case.

By 1930, there were in the United Kingdom two ancient English universities, a quartet of Scottish ones, universities and university colleges in Ireland north and south, a Welsh federated university, a large group of Victorian universities and colleges in London and the provinces, and a new group of twentieth century redbricks modelled on their civic predecessors. There were also non-university technical and arts colleges. In architecture and ethos, in student body, national reputation and financial support, in the style of self-government and in relation to their surrounding communities, these foundations differed greatly one from the other; but they were converging on a single type of institution, that of the present-day research and teaching university, emphasizing original scholarship and science and committed to professional training, with a small but growing postgraduate sector and a faculty chosen largely for its competence in the several fields of study and teaching. Some three-quarters of a century earlier their social and educational differences had been much sharper. In origin they were diverse, had grown up in response to different audiences, and for many decades did not always share the same higher education mission.

It is customary to associate the transformations in the world of higher learning with changes in the central direction of English history occurring in the late nine-

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teenth century. The period after 1870 was one of imperial expansion, sharp international trading rivalry, the application of science to manufacturing, and the development of the large industrial corporation. In these changing circumstances there was room for a new university mission. New industries, especially in chemicals, metals, or synthetic textiles simply could not function without applied science or high-level technological innovation, and they did not have traditions of basic research behind them to make the necessary technical changes unaided. Furthermore, better-trained managers were required in the large, publicly-owned firms. If such people did not themselves require training in research, they certainly had to understand the technical processes vital to industry. The imperial experience also encouraged a new perspective on the uses of higher education. Overseas expansion stimulated specific kinds of scientific work, for example, in tropical medicine or in civil and mechanical engineering, especially in connection with the construction of mines, ports, railroads and factories. The growth of government was yet another reason for an enlarged university role. The expansion of government through the establishment of a civil service recruited by competitive examinations led to the development of courses of university study as preparation for them. The increasing intervention by government into the economy and society also encouraged the growth of new professions, as in the social services or teaching.

It is equally true that the connection between higher education and other institutions was most often tenuous and unpredictable. The work of building a higher education system involved large numbers of scholars, scientists, civil servants, policy makers, pressure groups, community organizations, publicists, philanthropists and industrialists, as well as professional men and women not themselves in academic life. Given the strongly individualist character of Victorian society, their efforts were not and could not have been fully coordinated. From a dirigist point of view, the transformation of higher learning in England was largely uncoordinated and haphazard, full of what in historical retrospect appear to be digressions, misplaced emphases, lost chances, false starts and conflicts. To be sure, even historical irregularity has a logic, insofar as occurrences in time cannot be wholly random but must bear some relation to the overall culture of a society. This, at least, was the joyful conclusion of the mid-Victorian positivist, Thomas Henry Buckle, who claimed to have taken the idea from the poet and philosopher Goethe. But if institutional linkages existed, they were neither mechanical nor precise, and it is well to remember the somewhat anfractious route by which the university of the nineteenth century arrived in the twentieth.

In the essay that follows I take the fact of diversification as given, and I concentrate instead on the principal causes behind the remarkable intellectual and academic transformation in higher education. "Causes" must be understood as efficient or proximate rather than final, as reasons, explanations or categories rather than prime movers. To bring these out I have adopted a mode of discussion that moves between normative and historical explanation, that asserts what may be typical in a particular transformation but also recalls what actually happened. For purposes of comparison, as well as taxonomy, a normative approach is clear and useful, but it can never be wholly satisfying. It is static while history is dynamic, a process where events assume a character specific to time and place. It is my hope, therefore, that the two approaches will complement one another.

Changes in the structure and purpose of higher education bear a closer causal relationship to the development of an urban society than to industrialism *per se,* even though the latter has an obvious effect on the former. City life mediates economic change and redistributes its effects, generating a high and continuing demand for the most varied social and personal services. The spectacular growth of an urban consumer culture in the nineteenth century provided higher education with an opportunity to supply England with large numbers of specialists who increasingly called themselves "professional men," and behind them were the academicians, the members of the "key profession," the one that trained the others.[1]

Curiously, or perhaps understandably given the magnitude of the task, there are no standard histories of academic professionalism in England, although there are studies of the metamorphosis of the Oxbridge clerical don into the career university teacher. As late as 1911 census returns put university faculty into the blanket category of "teachers."[2]

Much work remains before useful detailed conclusions can be compiled concerning the relationship between the kind of bonding we call professionalization and the diversification of university and technical instruction. Certainly what needs to be solidly appreciated is that professionalization is an aggressive process. It has a self-propelled internal quality, or to invert a Victorian aphorism more used now than then: men may not make history exactly as they please, but they do try to make it. The characteristics of academic professionalism may be identified as measurable or certifiable competence, peer approval, full-time devotion to a career, and freedom from personal subservience or independence but through association.

The service function that lies at the heart of any professional self-perception requires a high degree of control over the market. The lead time necessary to establish teaching programs, train students and faculty, plan and carry out research or any of the other familiar academic tasks necessitates insulation from short-term economic fluctuations. Independence is particularly sought by academics because, not being self-employed, they are and have been vulnerable to changes in the economy and society. Their role model has not been the independent practitioner—the lawyer or physician, for example, who enters into a personal or fiduciary relationship with his client—but the public employee, the state administrator or army officer or Church of England clergyman. But the desire for independence has remained a constant.[3] Hence from the middle of the nineteenth century onwards the move towards academic professionalism has been characterized by special efforts to keep curriculum, recruitment, career, academic disciplines and the definition of service fully in academic hands. Since at no time are professors fully protected from shifts in supply

1. Harold Perkin, *Key Profession* (New York, 1969) and his essay in this volume.
2. Lord Ashby, "The Academic Profession," in *Minerva,* 8 (1970), 91.
3. From his study of industrial scientists and engineers today Kenneth Prandy has concluded that the self-conception of professional men and women is directly affected by a sense of autonomy. Strong feelings generate a concern for status, weak ones for class. Kenneth Prandy, *Professional Employees: A Study of Scientists and Engineers* (London, 1965), 41, 44, 175-8.

and demand, the phrase "ivory tower" has to be understood as symbolic rather than actual.

The idea of the academic as a professional man was compounded of two traditions, that of the Scottish university teacher and the Oxbridge don. The former had the greatest influence on the faculty organization of the newer universities, with the exception of Durham, which borrowed heavily from Oxbridge. Oxford and Cambridge in general contributed the idea of academic self-government, which itself was a borrowing from certain practices of a land-owning oligarchy long accustomed to sinecures, appanages, patronage, and a relatively free hand in English government and society. From the aristocracy, as well as from the two senior universities, came yet another influence, known to the Victorians as the "clerisy" ideal, a neologism of the Romantic poet Samuel Taylor Coleridge, and to present-day scholars as the "aristocratic model of professional growth."[4] This consisted of a gentlemanly style of living, a preference for public rather than private employment with the concurrent claim to be acting in the general good, and a group rather than an individualist ethic of behavior. The clerisy ideal was not wholly aristocratic, however, for it also included nineteenth century beliefs in merit, career, hard work and useful employment, as well as the necessity of competition as proof of good character, although in practice attention-getting had to be played down in the interests of group harmony. It should be apparent that such a guide or model for professional behavior has the latent function of reinforcing a sense of academic independence and of softening the suggestion of self-interest and ambition.

To the question posed in Konrad Jarausch's introduction, at what point in its history is an academic activity considered to be a profession, I return the tentative theoretical answer that this occurs when a branch of learning is considered to be the basis of a career, when that career becomes a virtual end in itself, and when its practitioners believe they have fundamental control over the survival, growth and perpetuation of their occupation. Thus the professor of botany at Cambridge in the 1850s was not a professional scientist because he thought of himself primarily as a parish priest. In the same period Sir Henry Maine, one of the pioneers of cultural anthropology, explained that as he could not earn a living as a professor, he practiced law as well.[5] None of this, however, is to be confused with the notion that academic professionalism depends upon absolute agreement on the methods of a particular field, for under situations of an expanding knowledge base such agreement is not likely to occur.

If professionalism was the ultimate thrust of academicians in mid-Victorian England when the "take-off" began, then it must also be acknowledged that the conditions for academic independence were not achieved in the nineteenth century. Arguably they have been more closely approximated in the twentieth century. In Victorian England there was considerable intervention into the affairs of Oxford, Cambridge and the Scottish Universities by Parliament and the Privy Council. Newer founda-

4. Magali Sarfatti Larson, *The Rise of Professionalism, a Sociological Analysis* (Berkeley, 1977), Chapter 6; Sheldon Rothblatt, *The Revolution of the Dons* (London, 1968), 86–93.
5. Ashby. See also Sheldon Rothblatt, review of *From Status to Contract: A Biography of Sir Henry Maine, 1822–1888,* by George Feaver, in *Journal of Modern History,* 43 (1971), 158–9 for the institutional source of Maine's occupational "pluralism."

tions were inadequately financed and matriculation levels too uneven to provide for either stability or predictable expansion. Furthermore, the civic universities, Durham, London and even the new collegiate foundations of Oxford and Cambridge were in varying degree subject to the authority of lay councils. Only the medical faculties of universities enjoyed comparative independence by virtue of their earlier recognition as part of a liberal profession. Beginning about 1900 academic senates began to take a stronger part in institutional decision making, and from then on in the provincial universities diversification was essentially a matter over which faculty had a larger degree of control.[6]

Finally, it must be understood that the phasing in of new subjects, new methods of research, new staffing patterns, library and museum development and innovation in general occurred at differential rates of change according to location, funding, sense of mission and institutional organization. Each segment of the academic profession followed a chronological development peculiar to itself, so that at any point in the last half of the nineteenth century the historian encounters status uncertainties, internal disagreements over curricula, widely divergent views on career and service, different measurements of competence, and a mixture of role model and reference groups within each branch of learning. A checkered history is more typical of academic professionalism than normative discussions can possibly suggest.[7]

Medicine jumped out first in the nineteenth century and led the way towards academic professionalism and consequently diversification. This was not surprising. The condition of cities called for a major epidemiological effort, and the consumer demands of a society with increased per capita income and concern for the quality of everyday life certainly favored the growth of a medical profession. Furthermore, physicians, if not surgeons or apothecaries, enjoyed a certain historic prestige which could be capitalized upon when needed. Medicine became the umbrella under which new scientific subjects entered the university, e.g., physiology, bacteriology, medical physics and organic chemistry. For centuries, in fact, medicine held an honorable place in the pantheon of university disciplines (if less honorable in the eighteenth century).[8] Physicians, surgeons and apothecaries often led the way in finding support for science. They were the prime movers, for example, behind the scheme to establish a Royal College of Chemistry in 1845.[9] They were the principal founders of medical

6. Graeme C. Moodie and Rowland Eustace, *Power and Authority in British Universities* (Montreal, 1974), 27–38. See also Lord Ashby's remarks in A. C. Crombie, ed., *Scientific Change* (London, 1963), 727.
7. For disagreements over the use and nature of economics by academic economists see Michael Sanderson, *The Universities and British Industry, 1850–1970* (London, 1972), 189. Differences in the internal history of a particular discipline can sometimes be attributed to the work of leading personalities or to timing or to both. See Richard Southern, *The Shape and Substance of Academic History* (Oxford, 1961), 11, 14; D. J. Palmer, *The Rise of English Studies* (London, 1965), 51, 71.
8. Roy Porter, "Science and the Universities," in *British Journal for the History of Science*. 9 (1976), 321.
9. Gerrylynn K. Roberts, "The Establishment of the Royal College of Chemistry: An Investigation of the Social Context of Early Victorian Chemistry," in *Historical Studies in the Physical Sciences*, 7 (1976), 437–86.

schools in the provinces, and several of these, such as Sheffield and Birmingham, became the nuclei of civic universities. Physicians like George Birkbeck had a strong hand in the establishment of what became known as University College, London, and the metropolitan evening college that today bears his name. It is a well-known fact that the success of the medical school at U.C. enabled it to survive a difficult childhood. One of the reasons that University College with its nonconformist, utilitarian and radical backing, and King's College, an Anglican foundation, were able to bury their differences and associate together as the University of London in 1836 was probably the common interest in medicine. By 1851 nearly 60 medical colleges, mostly free standing but some part of hospitals, were affiliated with the London University, which at that date was an examining rather than a teaching institution, the burden of instruction falling upon the constituent colleges and schools.

Some form of profession building had been going on in England since the eighteenth century, but from 1870 to 1880 onwards the movement towards academic professionalism accelerated. Furthermore, it now took a turn towards a wholly new objective, mission or purpose. This can be illustrated by the work of the famous commissions of inquiry appointed by the Crown and by Parliament to inquire into the teaching, studies, revenues and discipline of Oxford and Cambridge. The two that reported in the 1850s were concerned with the improvement of tutorial or collegiate instruction, but the ones that came after concentrated on improving the university or professorial part of instruction, and this began to include a formal research mission. The first set of commissioners thought in terms of a teaching institution, keeping before them the traditional "idea" of a university as a place for the dissemination of knowledge, not its advancement, and for the moral superintendence of young and immature students rather than for the imparting of skills and competencies. Even in the middle decades of the nineteenth century German science and scholarship were considered means of improving teaching, not a set of methods for pursuing basic knowledge. While the teacher might be allowed to undertake systematic inquiry in a particular field, it was not held to be an essential requirement for teaching. Because research, stressing critical inquiry, was thought to have a subversive dimension, it was far better to imitate than innovate. By contrast, the later commissions talked about encouraging research, improving technology and professional competence, and building up new specialties and disciplines. The problem was no longer one of making available to new social groups the knowledge that well-educated people already possessed, but of engaging higher education in the task of national advance and prosperity.

Demand for Higher Education:

Few topics in the history of the growth and diversification of higher education are so poorly understood as the function of demand. It is still glibly assumed that shifts in social stratification, or profound changes in the economy or evidence of a growing working-class consciousness provide undeniable proof of the existence of strong demand for increased access to institutions of higher education or of a new audience for new subjects. Such was simply not the historical case. The evidence for demand from below is almost always contradictory, confusing and ambiguous, whether for

basic literacy or numeracy or higher education.[10] There is a tendency in the history of education generally to assume demand when the supply side may be the crucial variable.[11] For instance, it is all too often asserted that the educational leaders of England thwarted the demands of parents for increased access to all levels of education for their children.

Without denying that social snobbery was a feature of Victorian culture, it must nevertheless be noted that the demand for higher education throughout the nineteenth century and well into the twentieth was spotty, to say the least, and being unreliable presented newer institutions with major headaches. Since their start-up costs were high, requiring an initial large capital outlay for construction and land, money for staff was in short supply, and little in the way of funding was available for the diversification of curriculum. The civic universities and London and to a certain extent Durham were established on the liberal political premise that once in operation these institutions would be successfully responsive to market forces. Their founders hoped that sufficient fee-paying students would be attracted to make a full program of studies possible. But short run disappointments were rather the rule. Many of the newer colleges led a perilous existence for the first decade or two, skating on thin financial ice which forced them into a variety of cost-cutting and money-raising expedients. When the numbers of full-time students at Owens College, Manchester, fell so low in the 1860s and 1870s that adequate staff could not be retained, evening classes and special courses for schoolmasters were introduced in order to attract students and increase fee income.[12]

In retrospect it is easy enough to criticize this decision which inevitably pushed the new foundations towards remedial and compensatory education[13] and compromised their standing in the eyes of older and more prestigious universities, but a reliance on market factors can have this historical effect. The reasons for low enrollments at redbrick are not hard to discern. They were the result of two factors: families where the support of a full-time student was a luxury whose benefits could not be perceived and an inadequate supply of properly prepared young persons. Being hamstrung, the new universities could do little to remedy the situation except wait for the slow and cumulative effects of the Balfour Education Act of 1902. In the meantime they quickly outdistanced their logistical support. Drawing their faculty from the pre-Victorian universities with long traditions of learning and scholarship, facing new social situations with high expectations, the faculty of the civic universities became frustrated and disappointed. And as the process of profession-building continued, with new disciplines and interests developing and the research mission being everywhere adopted, the income problem was exacerbated.

At best the effect of demand on diversification is difficult to measure. It appears to have had the most impact in precisely those areas where professionalization was most prominent, for in general professions feed themselves. Certainly there was a

10. Lawrence Stone, "Literacy and Education in England 1640–1900," in *Past and Present*, 42 (1969), 115–6.
11. But the mistake is not made by Thomas Walter Laqueur. See his *Religion and Respectability: Sunday Schools and Working Class Culture 1780–1850* (New Haven, 1976).
12. Palmer, 56–7.
13. See the contribution by Roy Lowe to this volume.

continuous overall demand for medicine or medical biology, but individual medical schools fared badly, and their success was not necessarily built on numbers. The famous Cambridge medical school, re-established in the 1870s, attracted few students, being staffed for research.[14] At Cambridge there was a demand for classics and mathematics, and at Oxford for Literae Humaniores, but most of the new academic specialties hardly attracted career-minded undergraduates.[15] Some of the most famous Oxford professors, pioneers in the several fields of learning, lectured to empty halls right up to the First World War.[16] This was the anomalous but direct result of the historical fact that the great knowledge revolution of the nineteenth century took place when post-graduate education was in its infancy. The striking structural peculiarity of higher education at the turn of the century was the widening gap between teaching and research, which was only slowly reduced by the introduction of the research degree and the arrival of the older, often foreign-educated student in search of specialized training.

Demand for higher education in general must always be carefully distinguished from demand that produces innovation and diversification. As indicated, instances of the former can be found, but very few examples of the latter. Even so, supply more often led demand in the period up to the First World War and even beyond. Academic career-building had more to do with the transformation of higher learning than student or parental pressures, which, where its effects can be discerned, were generally conservative. Parents preferred familiar and time-tested programs of study to the new directions in knowledge so conspicuous a feature of the world of higher learning before the war. This was as true of the demand for women's education as for men's; for while there is no doubt that a significant number of young women were available for higher education, well-prepared and achievement-minded, they were primarily interested in the subjects of the traditional syllabus. Given the uphill fight against much male opposition to women in higher education and the opening up of careers in elementary, and later secondary education, there is every reason to suspect this would have been the case.

The demand for university services generally other than teaching—for consulting or laboratory research, for example—was no more pronounced in England than the demand for teaching. Despite the anti-business bias implicit in the aristocratic model of professionalism, there does appear to have been a considerable amount of industrial research undertaken by professors in the provincial universities in their early years and by the London professoriate in the period 1900 to 1914. It is entirely possible there was more owing to secret research, as in the steel industry,[17] but it appears safe to speculate that as much of this work was solicited by career-minded academics as was sponsored by profit-hungry industrialists. The failure to develop on-going re-

14. Arthur Rook, ed., *Cambridge and its Contribution to Medicine* (London, 1971), 148.
15. The more specialized parts of the Cambridge Natural Sciences Tripos, for example, did not attract students until the 1890s when it became apparent that the creation of a national system of schooling was producing careers for science teachers. See D. S. L. Caldwell, *The Organization of Science in England* (London, 1957), 186, 196.
16. Charles Edward Mallet, *A History of the University of Oxford* (London, 1968) 3: 446.
17. Michael Sanderson, "The Professor as Industrial Consultant: Oliver Arnold and the British Steel Industry, 1900–1914," *The Economic History Review*, 31 (1978), 585–600.

search contacts between industry and some of the universities was more likely the fault of the former than the latter. In this respect the English and French situations seem comparable.[18]

The Impact of Donors:

Before 1850 universities and colleges had benefited greatly from charitable gifts and endowments for scholarships, professorships, fellowships, lectureships, for buildings, libraries and museums. Over the centuries these had come from many public and private sources, from wealthy merchants or their wives, from bishops, aristocrats and members of the royal family and from government and academics themselves. Motives ranged from religious reasons, honor and noblesse oblige to raison d'etat. This pattern of philanthropy carried on through the nineteenth and into the twentieth centuries, and for some of the same reasons, with the addition of a sense of civic pride, the feeling that great cities must possess universities as once it was believed they must possess cathedrals. Perhaps the most significant instances of gift-giving are the endowments and capital funds that successful businessmen, professional men and civic benefactors used to establish so many of the provincial universities and local medical colleges and technical institutes. Yet the historian who has most concerned himself with Victorian charity is dissatisfied with its overall record. He points out how much gift-giving was by academics of the old boy network, especially those in the ancient foundations, and how little, relatively speaking, came from the sources of new money.[19]

One of the several difficulties in assessing the historical record of gift-giving is the very different requirements of historical periods widely separate in time. If by one measure philanthropy in the sixteenth and seventeenth centuries was more successful than later, it was largely because higher education had not yet developed the voracious appetite it has demonstrated in the past century. The growth of research as a central feature of higher education altered the historic pattern of gift-giving. Very large sums were now needed for the expansion of museums, the creation of science laboratories, the building up of research libraries in all fields, as well as for the construction of classrooms, offices and lecture halls. It was necessary to increase the size of teaching staffs when the student population started to grow but even more so when academic specialism took off. Considerable amounts were particularly required for the establishment of the new university colleges, which shortly grew to university status, and after construction costs were met, there was a need to endow chairs and pay faculty. Even wealthy Oxbridge required substantial assistance. With some exceptions, the financial strength of Oxford and Cambridge lay in the "private" part of the university—in the colleges. The "public" or university part was weakly provided for. The last nineteenth century statutory commission had attempted to correct the imbalance by forcing the colleges to contribute some of their income to a University Chest, or by allowing the university a portion of college tui-

18. See Francois Leprieur and Pierre Papon, "Synthetic Dyestuffs: The Relation between Academic Chemistry and the Chemical Industry in Nineteenth Century France," in *Minerva*, 17 (1979), 218.

19. David Owen, *English Philanthropy 1660–1960* (Cambridge, Mass., 1964), 346 *et seq.*

tion to subsidize new subjects, or by consolidating small fellowships and assigning them to university purposes. When this plan was first envisioned college income was booming. A number of colleges had made a killing in the sale of land for the construction of railroads. But after 1870 college income declined as a result of the agricultural depression, very definitely threatening expansion and diversification. Consequently, both old and new institutions were in need of additional support.

Late Victorian dons have filled the pages of university history with complaints that their institutions were left impoverished, but in fact considerable support was forthcoming from the manufacturing community, if not in equal amounts to each institution, or for every subject now the object of academic professionalism. Some famous industrialists came forward with substantial sums for laboratories, chairs and buildings, as did those grand old benefactors, the London livery companies, but not on a scale comparable to American philanthropy. The contributions of municipal corporations, local professional associations, mechanics institutes, great commercial houses and industrial firms in creating technical colleges and university colleges has often been told. Most of the money given was for science and technology, for this was where new money was most needed and where individual professors were most active in soliciting support; but insofar as research was becoming important, there was no instant or automatic response to the financial requests of professors and heads, no immediate perception by all sectors of the business community that the support of university-based science and technology was essential to national economic strength. Nevertheless the metals and engineering industries of the north developed strong working relations with Sheffield, Birmingham and the Imperial College. Ship engineering and naval architecture were features of Glasgow, Newcastle and Liverpool universities. Brewing linked up with Birmingham.[20] These connections greatly benefited the civic universities in their earliest years, and they even contributed directly to the growth of specialism, since the spinoff from applied technology could and did stimulate work in basic science. Proximity to local industry or a strong and identifiable sense of civic pride on the part of the community seemed to be a requirement for good working relations between universities and industry, because the London professoriate, which aided other industries like steel and textiles, aircraft and radio-communications, did not succeed in attracting substantial pre-war financial support from Thameside manufacturing.[21]

The success of fund-raising varied according to time and place. There was, for example, no satisfactory response to the appeals of Oxford and Cambridge for help—at least collecting fell far short of announced goals, despite a really heavily-orchestrated campaign by specially-designed fund-raising associations representing a large number of fields. The campaign, in fact, had an adverse effect upon university morale and produced a split in the faculty, a fear on the part of some dons that big science would dominate the ancient universities and compromise the college system.[22]

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20. Sanderson, *The Universities and British Industry,* 10 *et seq.*
21. Sanderson, "The University of London and Industrial Progress, 1880–1914," *Journal of Contemporary History,* 7 (1972), 243–61.
22. George Haines, *Essays on German Influence upon English Education and Science, 1850–1919* (Hamden, Ct., 1969), 143–4; Rothblatt, *Dons,* 254–6.

Here, before the First World War, was a sign of the internal fracturing of the university under the pressure of the competition for funds, an indication of the primacy of the discipline over any university-wide loyalty. The Oxbridge appeal was unsuccessful partly because of the collapse of the "natural" constituency of the two universities, the old university-clerical world, and the failure as yet to acquire a new one. Many dons still harbored an anti-business scruple, and the feeling was reciprocated, but others very busily pursued the Edwardian millionaires, oblivious of the historic taboo.

Academic Interest Groups:

That supply is more important than demand in allowing diversification to take place receives confirmation from the actions of Victorian and Edwardian dons in securing an adequate support base for innovation and growth within higher education. English academics were not shy when it came to expressing their desires for patronage or their need for money, and from the middle of the century onwards the solicitation of funds for higher education projects was active and steady. Quite possibly the Parliamentary Committee of the British Association for the Advancement of Science was the first organized scientific pressure group on the historical scene. Reacting to the interest in applied science that followed the Crystal Palace Exhibition of 1851, it sought support for pure or basic science.[23] In the decades that followed famous names like Roscoe and Playfair, Thomas Huxley and Mark Pattison, and of a later generation, Haldane and Lockyer, kept the pressure up as very accomplished and energetic publicists. They formed professional associations, interest and lobby groups, arranged for newspaper coverage, made public speeches, contacted prominent benefactors, politicians and members of the civil service, and by so doing kept the requirements of modern universities foremost in the public consciousness. Many of them had spent some period of their early life in Germany, and they constantly referred to the German universities as the model universities, publicly comparing the support received there or in America with that in England. They were loudest on behalf of newer subjects, and because of this, as well as because of the rather strident tone of their campaigns, they irritated more reticent and less needy dons who believed that university autonomy would be adversely affected by new ties of dependency should the great publicists succeed.

Generational Factors:

There was a decided generational element in the diversification of higher education, but more work must be done before deciding how significant its overall contribution was. I would suggest that it was most important at the beginning of the development of a sub-discipline or at a moment of expansion, but as Joseph Ben-David and Awraham Zloczower have argued in connection with German disciplinary growth, the

23. David Layton, "The Educational Work of the Parliamentary Committee of the British Association for the Advancement of Science," in *History of Education*, 5 (1976), 25–39.

generational element must be combined with the structural peculiarities of an academic system in order to be significant. For structural reasons age-specific behavior is part of the history of teaching and reform at Oxford and Cambridge. The fellowships system there skewed appointments so that before the 1880s' abolition of celibacy and holy orders as requirements for tenure, fellows were either very young or very old. Younger dons were always involved in the Oxbridge reform movements of the nineteenth century because they had the most to gain in challenging what often amounted to a gerontocracy. Towards mid-century they very definitely spearheaded the attack on the "old college system," pressed for State intervention, insisted on the necessity for full-time academic careers and helped produce a revolution in teaching. Foreign and domestic observers were struck by the decidedly youthful tone of Oxford and Cambridge after the reform period. Romantics and aesthetes were enchanted by the beauty, insouciance and grace of the Oxbridge undergraduate in a setting of parks, gardens and ancient buildings; but others, who believed universities existed for the advancement of learning, were depressed by the immaturity, public school ethos and lack of intellectual seriousness in collegiate life.

The rather sudden expansion of the professoriate in the critical reform decade after 1876, partly in response to increasing matriculations and State pressure but also equally a function of professionalization, provided new career opportunities for young scholars and scientists who had been preparing themselves for precisely such a change. At Oxford the university teaching staff increased from 40 to 63, over half of whom received appointments after 1880. At Cambridge there was an even more spectacular infusion of new blood, since 61 out of 73 university appointments had been made since 1870.[24] The same effect occurred throughout the constituent colleges, providing Oxbridge with one of its most characteristic staffing peculiarities, a checkerboard of indolent old sinecurists and eager young hotshots. Certain disciplines were clearly being carried on by younger men, and this may have been true elsewhere in England during the early period of expansion. Before the institution of the research degree, long periods of academic apprenticeship were not required, and young men could be called to leadership positions early in their careers. One Principal of Firth College, Sheffield, was only 24. Sir George Humphrey was 22 when he became surgeon to Addenbrooke's in Cambridge. The study of European scientists circa 1900 by Heilbron, Forman and Weart shows that English physicists were much younger than their German counterparts,[25]and although they are reluctant to speculate on this fact, it is conceivable that this was one of a number of factors that account for the success of certain branches of physics in the period before the war. Such opportunities as existed in academic life before 1914 were not duplicated again until the great expansion of the 1960s, which likewise opened up opportunities for a younger generation of scholars and scientists.[26]

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24. Haines, 106.
25. Paul Forman, John L. Heilbron and Spencer Weart, "Physics *circa* 1900," in *Historical Studies in the Physical Sciences,* 5 (1975), 50–55. The median age of entry into the full professorship of physics was 32 in the United Kingdom but 37 1/2 in Germany.
26. The number of university teachers in the U. K. grew slowly if steadily from 1900 to the mid-1940s, when a sharp swing upward occurred. The graph is very steep in the 1960s and 1970s. See A. H. Halsey and Martin Trow, *The British Academics* (London, 1971), 140.

While research and specialism go together, directly affecting the process of faculty recruitment, the actual structure or constitution of an educational institution also plays a part in determining where and when innovation can enter the curriculum. However, as we shall see, no firm historical conclusions regarding the institutional forms most conducive to innovation are possible. What appears to be an organizational advantage may only be temporary, and what seems to be a structural barrier to change may turn out to be a boon. The internal organization of a university, school or college is no more independent than any other variable.[27] Nor is the age of an institution an indication of whether its faculty will readily take to fresh ideas or remain tradition-bound. It has been said of the University of Hull, which was founded in the late 1920s, that it was not innovative despite its youth, that on the contrary, it was born "middle-aged"[28] (like Falstaff, presumably, at three o'clock in the afternoon with something of a large belly).

Nevertheless, it is possible to suggest that from their inception the civic universities possessed a short-term structural advantage over Oxbridge in moving towards the research conception of a university. The organization of professors and lecturers into faculties—Arts, Sciences, Medicine, Technology, Commerce—put authority for courses of study, scholarships, prizes, appointments, degrees, diplomas, and certifications directly into the hands of faculty committees, whereas at Oxford and Cambridge right up to the war and beyond, responsibility for these was a confused matter of decision-making shared between university boards of studies, the "old schools," colleges and large bodies of alumni constitutionally empowered to vote on matters of curricula. In part the "country vote" was seen as an advantage in the earlier years of the nineteenth century when maintenance of the aristocratic and clerical ascendancy in the university was more important than innovation and discovery, but it was a decided liability three quarters of a century later when academic professionalism was attempting to reshape the intellectual character of the universities. Slowly, through a number of constitutional and structural changes that occurred in the years before the war, the university parts of Oxford and Cambridge came to dominate the colleges and to create what is now sometimes referred to as a federal system. The non-researcher, the "good college man," has been an endangered species since the Edwardian period.[29]

Another reason why the civic universities in their earliest years were able to do important work in applied research was necessity. Professorial remuneration varied

27. For a contrary view with respect to Germany, see the contribution of Peter Lundgreen to this volume.
28. Charles Carter, "On Being a Middle-Aged University," review by T. W. Bamford, *The University of Hull: The First Fifty Years* (Oxford, 1978), in *Minerva*, 17 (1979), 180–3.
29. It may even be suggested that the idea of the small American liberal arts college is also moribund, insofar as the curriculum is modeled precisely on that of the large research universities and the education of the faculty is that of the research scholar or scientist. See Rothblatt, *Tradition and Change in English Liberal Education, an Essay in History and Culture* (London, 1976).

greatly within redbrick, but it was usually less than what was deemed to be the necessary income of a professional gentleman. While endowments provided some income support, remuneration was also affected by matriculations, with laboratory and lecture fees providing a crucial portion of salary. Since enrollments were unreliable in the early years, professors went outside the universities into consulting and applied research, much as the old unreformed Oxbridge professoriate cast about for a living in the church or law and government, or the collegiate fellows went into private teaching. A further reason for the substantial interest in applied research at the civic universities was the generally low level of student preparation. The mathematics professors at Leeds simply refused to do remedial teaching.[30] As teaching institutions the redbrick reputation suffered in comparison with Oxbridge, but as centers of technology, their success record in applied research was substantial.

From the standpoint of profession-building, however, the situation that existed at Leeds, Sheffield, Liverpool and Nottingham was far from satisfactory. Consulting as a steady means of income supplement was not reliable, as the work depended upon the needs or desires of the consulter, as did any externally-sponsored research. Under these conditions certain kinds of intellectual problems could not be pursued; and some forms of basic science suffered. Ironically, what soon freed the redbrick professoriate was the development of research laboratories within industry itself—laboratories which no longer required the services of an outside consultant or researcher but which could still absorb graduates trained by him.[31]

The situation was different with respect to arts subjects. While the demand for instruction began to increase with direct and indirect government subsidies for the training of teachers, there were few opportunities for outside work. In addition, relations between teachers and potential benefactors or employers were sometimes strained. The establishment of arts faculties in redbrick universities owed much to Oxbridge—sponsored extension lectures and a system of local examinations. Arts lecturers and professors were often recruited from Oxford and Cambridge. Touched with the clerisy brush, believing in the civilizing purposes of liberal education, they were occasionally at odds with a community of practical-minded philanthropists and potential donors. Nathan Bodington, the Principal of Leeds, who was trained in classics at Oxford, was one of those Victorian academic leaders who did not get on with local business precisely because of his different outlook on the purposes of university education.[32]

At Oxford and Cambridge, the collegiate organization of teaching and the absence of a newer-type senate organization with overall responsibility for curriculum and instruction forced innovation along different lines. One of the reasons why the diversification of intellectual and academic life at Oxford and Cambridge is so difficult to follow is that there were so many different possible entry points into the system. Who would have predicted, for example, that the teaching of Scandinavian languages at Oxford was introduced by the Oxford University Press, which suddenly found itself with money that could, in the hands of an interested party, be diverted for the pur-

30. A. N. Shimmin, *The University of Leeds, the First Half Century* (Cambridge, 1954), 19.
31. Sanderson, *Universities and British Industry*, 94, 119.
32. Shimmin, 13. The year was 1882.

pose,[33] or that the famous Cambridge medical school led by the physiologist Michael Foster would be partly the result of the reform movement within Trinity College, which brought him to Cambridge with a college appointment? If the collegiate structure of Oxbridge was a handicap in some ways, it was beneficial in others, and many instances of college sponsorship of new work could be cited. A college might be more interested in teaching traditional subjects than in providing for new ones, but once interested in new work and new subjects, it was easier for a single college to introduce them than open the matter to university-wide debate. Science had been coming into the universities this way ever since individual dons installed their personal, primitive laboratories in out-of-the-way college rooms at the beginning of the nineteenth century.[34]

The Cavendish Laboratory is probably the most famous example of how diversity could occur at Oxbridge. A handsome endowment from Lord Devonshire, an aristocrat-industrialist, established a well-equipped Cambridge laboratory that stood outside both the collegiate structure and the faculty organization. The Cavendish did not have to prepare students for examinations, and it was in a position to attract and train young researchers entirely out of its own resources. The lines of inquiry of the Cavendish were established by its great directors, Maxwell, Rayleigh, J. J. Thomson and Rutherford, and because of this independence the laboratory was able to take advantage of the introduction of research degrees into Cambridge in 1895 to sponsor research dissertations which could then be used by colleges—if they chose—as a basis for appointments to fellowships. The Cavendish developed a special ethos, as symbolized by its famous afternoon teas, and became the model for scientific work, expressing in perfect measure all of the requirements of academic professionalism. Some of the success of the Cavendish was repeated at Manchester, which also had a well-endowed physical laboratory; but elsewhere, because of less generous support, professors associated with laboratories had to spend a greater amount of time teaching the more elementary aspects of their subject.[35]

The Action of Government and the Effect of War:

While its role varied, the State was involved in higher education from the start. In subtle and indirect ways at first, and in direct ways later, the State can be considered one of the most decisive influences in the diversification of higher education in England. This is a somewhat unorthodox position. It is more common to contrast the English State with the German one and to point out, often deprecatingly, how uninterested it was in the problems of university education, science, technology, teacher training and academic discovery. I would like to suggest that this was not exactly the

33. Charles Firth, *Modern Languages at Oxford, 1724–1929* (Oxford, 1929), 55–7.
34. In the right academic setting with the right student even neglect plays a part in encouraging innovation. Thus it was the student subculture of collegiate Oxford that enabled the brilliant young scientist, Harry Moseley, to advance in his physics studies. See John L. Heilbron, *H. G. J. Moseley, The Life and Letters of an English Physicist, 1887–1915* (Berkeley, 1974), 37 *et seq.*
35. Romualdas Sviedrys, "Physical Laboratories in Britain," in *Historical Studies in the Physical Sciences*, 7 (1976), 435.

case. The historical problem has been oversimplified because of the failure, as Roy MacLeod has noticed, of historians of science (and universities) to recognize the particular features of government in the nineteenth century.[36]

It is true that in the nineteenth century the island was passing through what is commonly called a "liberal" phase. This textbook commonplace, while containing a particular kind of truth, does not tell the whole or even the most important part of the story. Talk of a minimal state in 1860 might have made good copy but poor history. Centuries of development had created a very powerful central State, and the unique history of English constitutionalism (as measured against other European countries) had allowed a fairly large and experienced group of titled and lesser aristocracy, much interpenetrated with the other strata of English society, to gain political experience at every level of government, national or local. By historical habit the landed aristocracy was interventionist. Furthermore, the English State was not what it was in Romantic thinking, an abstraction embodying national purpose, the whole to which the parts adhered and the spiritual as well as political center of national life, but a collection of ministries, boards, agencies and councils performing a variety of tasks, not always strictly coordinated, and by a complicated process of legislative and executive interaction subject to a variety of competing demands and wishes. This too was an aristocratic legacy—the product of oligarchy rather than monarchy, of a community of peers equal in status if not in power or income.[37] In these circumstances the great landlords and heads of houses could continue to exert influence at the very heart of English politics, and individual ministers, undersecretaries and other civil servants were relatively free to respond to the changing social conditions of English life as their education, networks of friends, past associations and political ambitions inclined them.

Against the Liberal doctrine of the minimal State, then, must be laid the custom of State intervention along the ancient caravan routes of aristocratic patronage. But even the Liberal State recognized the necessity of ad hoc decision-making in response to specific problems or demands. This temporary conjunction accounts for the characteristic responses of the Victorian State even as it moved forward in the second half of the nineteenth century to rational, bureaucratic government. Decision-making could occur almost anywhere within the structure of government, and consequently there was indeed some provision of State aid to higher education, even to research, but it was not systematic. The various agencies of government, as yet uncoordinated by the Treasury, made decisions independently of one another, and advice was sought where needed. Even before the enactment of the famous civil service reforms of the nineteenth century, experts and consultants were brought into government to advise on matters of educational policy, and even in the supposed heyday of the minimal State there was an impressive range of government assistance to the higher education sector. For example, recent writers have emphasized how much

36. R. M. MacLeod, "Science and the Treasury: Principles, Personalities and Policies, 1870–1885," in *The Patronage of Science in the Nineteenth Century,* ed., G. L. E. Turner (Leyden, 1976).

37. Hence the vulnerability of aristocratic cabinets to outside pressure groups in the early Victorian period. See D. A. Hamer, *The Politics of Electoral Pressure* (Hassocks, Sussex, 1977), 324–8.

scientific research activity was sponsored by government in the first half of the nineteenth century.[38] There were tidal, ordinance and geological surveys and expeditions. The government supported scientific posts at the Botanical Garden at Kew, the observatory at Greenwich and the Assay Office of the Royal Mint. The Medical Department of the Privy Council contributed to various kinds of scientific projects. The Inland Revenue and Excise Department sponsored astronomical, hydrographical and munitions research, and the Commissioners of Woods and Forests encouraged geological work through the Museum of Economic Geology and the Mining Records Office. A Government School of Mines and Science Applied to the Arts was founded in 1851. Parliamentary grants were given to the various royal societies, sometimes as on-going subventions, sometimes for specific projects, so that the Royal Society, the Royal Geographic Society, the Royal Society of Edinburgh, the Scottish Meteorological Society could count on intermittent and recurrent assistance from London.

In support of teaching the government provided for the Regius professorships at Oxford and Cambridge, and, for reasons that go back to the ancient days of a separate Scottish Parliament, Whitehall assumed financial responsibility for the universities of Scotland. For the new examining University of London the government provided aid from the late 1830s onwards for the conduct of examinations, the award of prizes and honors, and for maintenance and repairs to buildings.[39]

In the later nineteenth century and twentieth century even much greater assistance went to higher education. The new universities and colleges received money (initially at their request), as did the new Welsh universities and Irish ones. The Board of Education supported the Imperial College, referred to journalistically as the new South Kensington "Charlottenburg." The Treasury increasingly supported engineering and medicine, including the medical school at Cambridge—this before the institution of recurrent state grants to Oxford and Cambridge. The National Health Insurance Act of 1911 funneled some money into medical research as well, and thereafter a Medical Research Commitee of the Privy Council was formed. The Board of Agriculture gave research grants from the 1890s onwards and afterwards financial support was carried on by a Development Commission for Agriculture and Fisheries. Local authorities, too, contributed to civic universities and to London University before and after the reorganization of local government in the last decades of the nineteenth century, but the major support came from the State and its executive branches. In fact the State, in creating national systems of elementary and secondary compulsory education, did more for the teaching of science generally and indirectly for the diversification of higher education than any other single source after the turn of the century. Grants were given to all institutions possessing departments for the training of teachers. State action drove up enrollments, stabilized university income, and stimulated growth in the size of teaching and research staffs.

The First World War produced more State activity. The military technology effort led to increased aid of all kinds to the education sector. After the war, because of the

38. MacLeod, "Resources of Science in Victorian England: The Endowment of Science Movement, 1868–1900," in *Science and Society, 1600–1900,* Peter Mathias, ed. (Cambridge, 1972), 111–66; W. H. Brock, "The Spectrum of Science Patronage," in Turner, *ibid.*

39. Eric Hutchinson, "The Origins of the University Grants Committee," in *Minerva,* 13 (1975), 583–6; Robert O. Berdahl, *British Universities and the State* (Berkeley, 1959), 20–68.

running down of plants due to forced neglect, the insatiable requirements of big science and the need to find better support for junior faculty, as well as the distortion in enrollments produced by conscription and wartime manpower needs, the University Grants Committee was created to put the financing of higher education on a firm and consistent basis. In the same spirit the Department of Scientific and Industrial Research was projected in 1915.

There is no doubt that the war years were a watershed in university-State relations. Yet I would like to stress that the machinery for government intervention into the higher education system had long been in place, as well as an attitude of assistance congenial to the academician. This explains why unaffiliated intellectuals like the Benthamites, or individual Oxbridge dons, or members of the clerisy or science publicists like Playfair and Roscoe readily turned to the State for support. The Victorian intelligentsia had always been more confident of their ability to persuade government to support them than private philanthropy. They were confused about the meaning of industrialism, worried about political democracy even when they spoke in favor of it, fearful of the effects of cultural pluralism after centuries of leadership from above by the landed aristocracy and its hangers-on, the "natural leaders" of society. They worried more about the possible effects of "public opinion" than about government intervention, and as academic professionals they preferred to risk their independence with the latter than with the former. The Liberal voice of the nineteenth century may from time to time have expressed concern about the consequences of heavy state funding for higher education, but it was only one of several influential voices. And these are the reasons, if not the only reasons, why England before the First World War moved towards the European model of centrally-supported higher education rather than towards the American one of private, local and regional support, despite some of the heavily plural and decentralized features of Victorian civilization. After all, honors, recognition and prestige had always flowed downward from the Crown and government; central direction had always characterized the English State. In historical perspective the Liberal State was only an interlude.

Peter Lundgreen

Differentiation in German Higher Education

Academic Institutions and Scholarly Disciplines:

For the purposes of international comparison, Burton R. Clark has recently suggested four categories which might be helpful in analyzing the differentiation of national systems of higher education. Among institutions, a division of labor may take place in two dimensions: Horizontally, alternative institutions (such as the public and private *sectors*) may serve similar purposes, or the various *sectors* may serve alternative purposes (such as universities and polytechnics). Vertically, *hierarchies* may be distinguished among the institutions, whether as rungs of the educational ladder or as prestige ranking. Within institutions, horizontal differentiation occurs "in the form of a division of labor by fields of knowledge" (*sections,* such as faculties, departments, scholarly disciplines). Vertical differentiation, on the other hand, "centers on levels of training and certification" (*tiers,* such as undergraduate and graduate study).[1]

Only two of these four distinctive cases will be considered in the present study: horizontal differentiation *among* institutions ("sectors") and horizontal differentiation *within* institutions ("sections"). Clark sums up the current state of knowledge regarding the relevant processes of differentation: "Basic research is lacking on such crucial matters as the ways in which disciplines emerge and penetrate university structures to become permanent parts of them, how prevailing disciplines split or recombine their parts to form new *sections.* ... The best ideas currently available give us some insight, largely on the development of institutional types, hence on *sector* differentiations."[2] Fortunately, it is in sector differentiation, or the division of labor among institutional types, where the major countries obviously differ. It should not be surprising that comparative education likes to take up this topic. On the other

1. Burton R. Clark, "Academic Differentiation in National Systems of Higher Education," in: *Comparative Education Review,* 22 (1978), 243, 247–8, 249–50. The extensive collecting of data for this article would not have been possible without the help of my research assistants E. Bolenz, Th. Möller, and R. Portmann.
2. Clark, 251.

hand, scholarly disciplines tend to be regarded as international commodities. Hence "the basic sectioning of the natural sciences into such fields as physics, chemistry, and biology, and well-defined subfields thereof, has wide currency," and probably a fairly common history.[3]

Within the limits of a mono-cultural study, it is inappropriate to analyze the German system of higher education as it differed from other national systems in terms of *sector* differentiation. Similarly it is impossible to examine prevailing assumptions regarding a fairly common process of differentiation by disciplines (*sections*) within institutions. Confined to developments *within* the German system of higher education, two lines of investigation will be pursued: (1) Changes in the differentiation among institutions or (2) changes in the disciplinary differentiation within institutions. Only the second of these two dimensions of differentiation deserves detailed study, especially since "basic research is lacking," as Clark has noted. Consequently, the bulk of this paper will be devoted to a rather elementary and descriptive work preparing the ground both for more specific analysis and for international comparisons.

If studied for Germany as a single country and for the time under consideration, differentiation *among* institutions is of comparatively little interest. Bearing in mind slogans such as "the rise of industrial capitalism" and "the rise of science as big business," institutional diversification of higher education in Prussia displays an extraordinary degree of continuity and stability (Table 1). Most institutions have a long history going back to earlier times when the Continental bureaucratized state of the 18th and early 19th centuries felt obliged to provide for the training of a wide range of professionals. Only one dynamic crisscrosses this seemingly well-planned functional spectrum of institutions, and that is "academization," or the endeavor to gain university-like status. An eminent case in point are the polytechnical schools which, since the 1870s, became technical universities but reached equal footing with the universities proper only in 1900. Teacher training colleges managed to emulate their technological forerunners only during the 1960s.

The traditional spectrum of institutions was enlarged merely in two instances. Business schools and academies of administration were founded from 1898 onwards, and teacher training colleges followed after 1924. In addition, the number of institutions of the traditional spectrum did not change for a long time. Exceptions are two technical universities (Breslau, Danzig) and two new universities (Frankfurt, Cologne), all founded between 1904 and 1919. The really significant changes, then, must be supposed to have taken place *within* the institutions.

A first impression of the assumed developments may be gained, if the Prussian institutions are weighted by teaching personnel and by students (Table 2). The rise of the "mass university" is too well-known to need another description. Among the non-university institutions the technical universities clearly dominate since they equal all remaining "academies" in terms of size. Because the typical "academy" is a tiny institution, we are well advised to confine the following study to universities and technical universities. Thus we are dealing with some 85 percent of the academics employed at institutions of higher learning, and with some 90 percent of the students studying at these institutions.

3. Clark, 257.

Table 1: Academic Institutions in Prussia, 1875–1930

Institutions	1875	1885	1895	1905	1913	1920	1925	1930
Universities	10	10	10	10	10	12	12	12
Technical Universities	3	3	3	4	5	4	4	4
Mining academies	2	2	2	2	2	1	1	1
Academies of agriculture	3	2	2	2	2	2	2	2
Academies of forestry	2	2	2	2	2	2	2	2
Veterinary academies	2	2	2	2	2	2	2	2
Academies of philosophy and theology	5	5	5	5	5	7	7	4
Business Schools	–	–	–	2	3	2	2	2
Academies of administration	–	–	–	–	1	1	2	2
Teacher training colleges	–	–	–	–	–	–	3	15

Source: Statistische Jahrbücher für den preußischen Staat.

Table 2: Teachers and Students at Prussian Academic Institutions, 1875-1930

Year	Teachers			Students		
	Univ.	Techn. U.	other	Univ.	Techn. U.	other
1875	866		87	7,924		601
1885	1,066	154	127	13,395	962	1,351
1895	1,267	223	220	13,598	2,824	2,422
1905	1,621	325	273	20,813	4,737	3,833
1913	1,790	431	381	27,564	4,906	4,759
1920	1,916	430	307	34,470	8,781	6,180
1925	2,303	412	470	28,282	8,472	5,647
1930	2,433	437	645	44,889	8,668	6,711

Source: Statistische Jahrbücher für den preußischen Staat.

If horizontal differentiation *within* universities and technical universities is the central topic, what are the appropriate units of investigation? Clearly it is primarily the scholarly disciplines which have to be studied. Disciplines may be defined as forms of social institutionalization which correspond, though sometimes lagging in time, to processes of cognitive differentiation within and across fields of knowledge. Typically, disciplines can be identified by the following traits: a fairly homogeneous network of communication between the scholars (scientific community); an accepted body of knowledge which can be taught in principle; a number of common problems and lines of investigation; a set of research methods and paradigmatic problem solutions; specific career structures and selection processes determining recruitment and promotion.[4] Discipline formation centers around subject-matters posing specific problems, and the autonomy of disciplines along cognitive-communicative lines can be distinguished from the organizational institutionalization of disciplines at a university. Disciplines as cognitive units may be empirically studied by relying on scholarly journals and learned societies. The present paper is rather confined to the study of disciplines as organizational or institutional units. This analysis will proceed on the basis of two main indicators: teaching subjects (disciplinary differentiation of teaching) and research institutions (institutionalization of disciplinary research).

The Disciplinary Differentiation of Teaching:

As far as the differentiation of fields of knowledge into scholarly disciplines is indicated by the denomination of chairs (or of teaching subjects), the decisive developments took place in the first half of the 19th century. A classic position is Ben-David's:

> By about 1860 the original four faculties of theology, philosophy, law and medicine, comprising just about all higher knowledge existing at the beginning of the century, had been transformed beyond all recognition. A host of new disciplines had found their place within the loose frame of the faculties, none of which—with the exception of theology—seems to have been averse to incorporating new fields. Commencing with the third quarter of the century this process of expansion and differentiation slowed down. ... The universities not only began to offer increasing resistance to the introduction of new sciences which had mushroomed outside their walls, they also placed often insurmountable obstacles on the path of disciplines which had begun to develop organically within the established disciplines.[5]

Against these sweeping judgments it must be noted that the history of disciplinary differentiation at German universities prior to 1864 simply has not yet been studied comprehensively for all teaching subjects. Therefore we have to leave aside the controversy of whether the core disciplines differentiated already around 1800 or only during the first half of the 19th century.[6] Similarly, it is not possible to evaluate the alleged slowdown after 1870 by comparing two "speeds" of disciplinary differentiation. What can be done, however, is to pinpoint the extent of disciplinary differentia-

4. Rudolf Stichweh, "Differenzierung der Wissenschaft," in: *Zeitschrift für Soziologie*, 8 (1979), 83.
5. Joseph Ben-David/Awraham Zloczower, "Universities and Academic Systems in Modern Societies," in: *European Journal of Sociology*, 3 (1962), 49.
6. Ben-David/Zloczower, 54; Stichweh, 83-4.

tion prevailing in 1864 (or, sometimes, only in 1890), and to distinguish subsequent changes presumably in the direction of additional differentiation.

The most detailed source for such an undertaking is *Minerva,* a yearbook of the learned world published since 1891.[7] *Minerva* lists all academics, employed at an individual institution by name, by professorial rank and by scholarly discipline. Covering all countries and all institutions of higher learning within each country, *Minerva* offers rich material for cross-national comparisons. But the information is difficult to handle since it has to be reorganized along disciplinary lines, at least if processes of horizontal differentiation within institutions are to be investigated. In his pioneering study of the German professoriate, Christian von Ferber fortunately has done precisely this (among other things), for the years from 1864 to 1953.[8] Confined to Germany, he relied on the annual catalogues of the individual universities and (since 1900) of non-university institutions. Coming up with a collective biography of some 23,000 academic teachers, his basic findings are presented according to faculties or fields of knowledge broken down into various subgroupings. In other words, Ferber traced his population by the current title of subjects each individual was charged to teach. Then he organized the array of denominations into clusters according to a system of disciplinary groupings. In doing so, he relies partly on traditional groupings such as faculties or departments. But since these intra-university structures do not apply to all fields of knowledge, he rightly warns against any premature inferences from nominal to real disciplinary differentiation (high or low).

On the micro-level, Ferber distinguishes 275 disciplinary units, which he distributes into 13 macro-units and their subgroupings (Table 3). Most of his tables refer to the higher levels of disciplinary aggregates, but for 45 out of the 275 individual disciplines he presents the original figures. 43 of the 45 disciplines are already present in 1864. In other words, whatever our assumptions may be regarding the institutional history of the remaining 230 disciplines, the Ferber data do not indicate much emergence of new disciplines after 1864. Rather the data show growth within a given spectrum of disciplines.[9] Do we therefore have to conclude, for the time being, that processes of differentiation date back to an earlier time and then come to a standstill?

A first answer is negative, if we broaden the concept of disciplinary differentiation to include the regional spread of disciplines. Ferber takes up this point when he compares big and small universities and discusses the respective representation of core disciplines vs. specialties at these institutions. His major findings are that, in 1864, big universities display a higher degree of specialization than small ones in the realm of core disciplines. By 1910 small universities catch up in level of specialization, whereas big universities meanwhile have established additional chairs both for the core disciplines and for some disciplinary specialties ("luxury" or research subjects).[10]

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7. *Minerva. Jahrbuch der gelehrten Welt,* vols. 1-30 (Berlin, 1892-1930).
8. Christian von Ferber, *Die Entwicklung des Lehrkörpers der deutschen Universitäten und Hochschulen 1864-1954* (Göttingen, 1956).
9. Growth processes as such are not dealt with in this paper; they are extensively documented and analyzed in Ferber's book.
10. Ferber, 54-57.

Table 3: Fields of Study and Scholarly Disciplines at German Academic Institutions after 1864

fields of study	number of disciplines			
1. Protestant theology	8			
2. Catholic theology	9			
3. Law	6			
4. Medicine	24			
5. Humanities	51			
a. European languages		11		
b. Noneuropean languages		8		
c. Comparative philology		2		
d. Philosophy, psychology, pedagogy		3		
e. History		12		
f. History of Art, fine arts		4		
g. other		11		
6. Natural sciences	50			
a. Chemistry		22		
- Basic chemistry			5	
- Applied chemistry			17	
- Technical chemistry				9
- Pharmaceutical chemistry				4
- Food chemistry				3
- Agricultural chemistry				1
b. Physics		11		
- Basic Physics			3	
- Applied Physics			8	
c. Biology		6		
d. Astronomy, geophysics, meteorology		3		
e. Geology, mineralogy		2		
f. Mathematics		3		
g. Geography		3		
7. Economics	3			
8. Social Sciences	6			
9. Veterinary medicine	10			
10. Science of agriculture	7			
11. Science of forestry	6			
12. Technical Sciences	89			
a. Surveying		3		
b. Architecture		11		
c. Civil engineering		17		
d. Machine building		23		
e. Electrical engineering		12		
f. Shipbuilding		7		
g. Aircraft construction		5		
h. Mining		4		
i. Metallurgy		7		
13. Other	5			
Total	275			

Source: Ferber, 1956, 187-94.

Similar reasoning applies to the "strength" of individual subjects as indicated by the numbers and rank level of academics representing them (Table 4). During most of the decades under consideration we find some 20 universities throughout Germany. Taking this number as a yardstick, we may ask for the points of time at which

Table 4: Full Professors (Associate Professors, Privatdozenten) per Discipline at German Universities, 1864–1931

Disciplines	1864	1873	1880	1890	1900	1910	1920	1931
Medicine								
Anatomy	23(7,11)							34(33,25)
Surgery	23(7,14)							25(119,52)
Internal medicine	20(9,10)							40(132,93)
Gynecology	16(3,18)	20(4.2)						24(63,41)
Physiology	15(3,9)		20(3,22)					27(24,23)
Pathology	7(5,4)				20(4,11)			24(21,30)
Opthalmology	3(11,8)				21(16,23)			23(36,22)
Hygienics	1(-)					23(11,28)		27(41,35)
Psychiatry	-(2,7)	1(4,12)				20(17,55)		27(65,45)
Pharmacology	7(3,3)							22(16,17)
Dentistry	-(-,1)		1(-,3)					22(31,22)
Physiological Chemistry	-	1(-,1)						9(12,10)
Natural Sciences								
Botany	17(8,10)		26(10,7)					27(25,20)
Zoology	11(5,5)			20(12,21)				30(41,30)
Pharmaceutical Chemistry	3(9,2)							15(14,7)
Physical Chemistry	-(-,1)	1(1,-)						19(12,12)
Agricultural Chemistry	1(2,-)							7(4,4)
Astronomy	12(6,2)							14(7,7)
Humanities								
Classical Philology	43(11,14)							54(14,18)
Philosophy	36(21,23)							56(51,32)
German Philogogy	14(8,9)	20(7,7)						48(22,27)
Medieval and modern history	19(4,19)			25(6,9)				24(12,19)
Ancient history	4(1,1)				20(5,11)			22(4,7)
Romance philology	3(1,3)					23(8,10)		18(11,10)
Classical archeology	9(4,6)						20(6,4)	18(9,7)
English philology	-(-,1)	2(1,1)					22(4,6)	22(10,7)
History of Art	4(2,2)							14(21,25)
Modern history	5(1,1)							18(6,11)
Indology	3(1,-)							13(6,7)
Musicology	-(3,1)				1(7,5)			8(11,18)
Pedagogy	2(1,-)							6(10,8)
Slavonic philology	1(-,1)							4(5,2)
Psychology	1(-)							5(9,10)

Source: Ferber, 1965, 204ff.
- Status of 1864
- Time when at least one full professorship is established
- Time when at least 20 full professorships are established
- Status of 1931

various disciplines are represented by 20 full professors. This bench mark of institutional maturity, which is roughly equivalent to being present at each individual university, was gradually reached or surpassed by some disciplines, or never attained by others. In some instances, disciplines below this level of general acceptance show high figures for associate professors or *Privatdozenten* (e.g., opthalmology, psychiatry); but in many other cases this plausible rule does not apply. Since almost all disciplines covered so far already existed in 1864, we may speak of differential growth rates within a given spectrum of disciplines, but not of disciplinary differentiation proper.

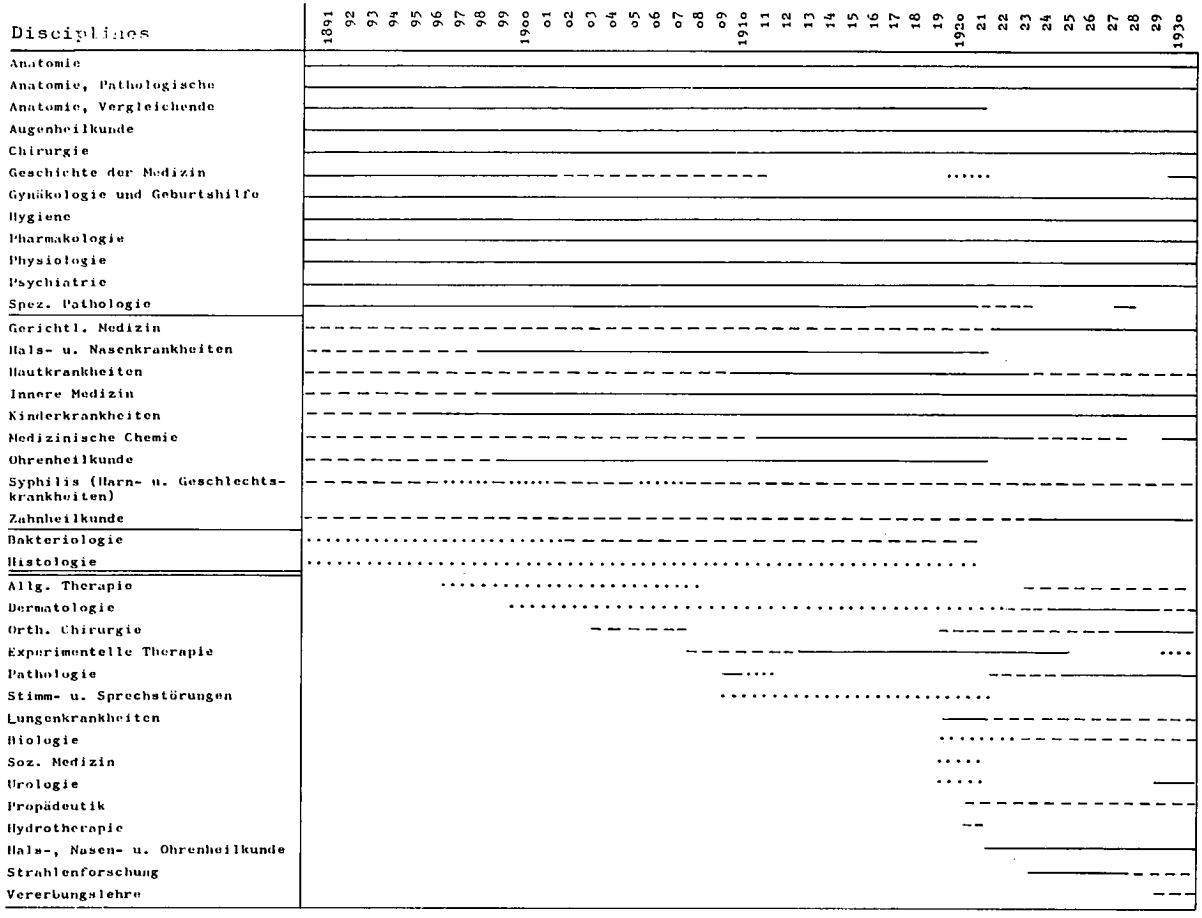
A second answer to the question of whether there was any disciplinary differentiation after 1864 is possible. If we confine the study to the period from 1890 onwards and base it on *Minerva,* the answer is positive (Tables 5–7). In order not to be overwhelmed by the massiveness of data, several limitations have deliberately been employed. First, only one out of some 20 German universities has been studied. Our example is the University of Berlin, which can safely be supposed to embrace the widest range of specialized disciplines at the time. Secondly, all questions of size and growth have been disregarded. In other words, every disciplinary unit is just counted once, and weighted only in terms of the rank level of its "highest" representatives, not in terms of their number.

Medicine is a case in point (Table 5). In 1890, some 23 different subjects (disciplinary units) are represented in the Berlin faculty of medicine. Among them some 12 had already reached the rank level of full professor, while nine and two still stood below on levels of associate professor or *Privatdozent* respectively. During the following four decades several developments took place: (1) the upgrading of established disciplines (e.g., pediatrics); (2) the downgrading of, or vacancy in, established disciplines (e.g., history of medicine); (3) the recombination of established disciplines (e.g., otorhinolaryngology in 1921); (4) the emergence of additional, specialized disciplines. New disciplines tend to start on the rank level of a *Privatdozent,* but their institutional history shows comparatively little continuity. One might think of practitioners offering specialized courses in addition to the core disciplines. On the fringes of the spectrum it seems as if we can grasp some of the differences between disciplines as cognitive or as institutional units, with the former not necessarily attaining the status of the latter permanently.

Similar observations can be made with reference to the huge faculty of philosophy which then still contained both the humanities and the natural sciences (Table 6). Disciplinary differentiation, in the sense of specialization along cognitive lines, seems especially rich within the humanities. This finding agrees with Ferber who studied differential growth rates and argues that the humanities are relatively open to including "luxury" or research specialties besides the core disciplines. Thereby the teaching professions not only received their appropriate training at the universities, but the cultural and historical interests of a wealthy bourgeoisie were also increasingly served by the flourishing liberal arts.[11] Disciplinary differentiation must also be attributed to the inherent logic or internal dynamics of scientific development. But it is only on the level of disciplinary case studies that such questions can be analyzed.

11. Ferber, 62–66.

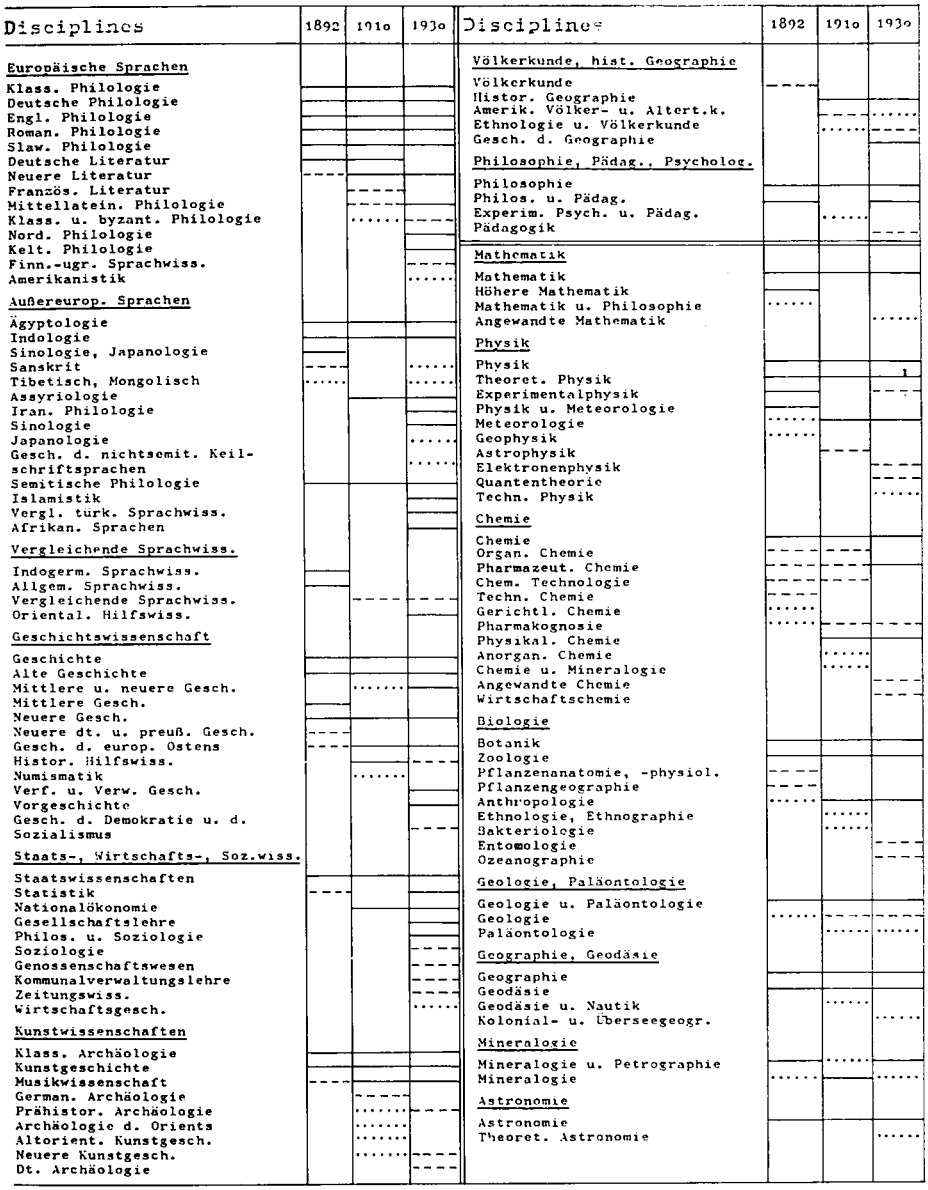
Table 5: Disciplines at the Medical Faculty of Berlin University, 1890–1930



Source: Minerva. Jahrbuch der gelehrten Welt

1st rank: professor in ordinary ——— 2nd rank: extraordinary professor ---- 3rd rank: Privatdozent .....

Table 6: Disciplines at the Philosophical Faculty of Berlin University, 1890-1930



Source: Minerva. Jahrbuch der gelehrten Welt

1st rank: full professor ———

2nd rank: extraordinary professor - - - - - -

3rd rank: Privatdozent .....

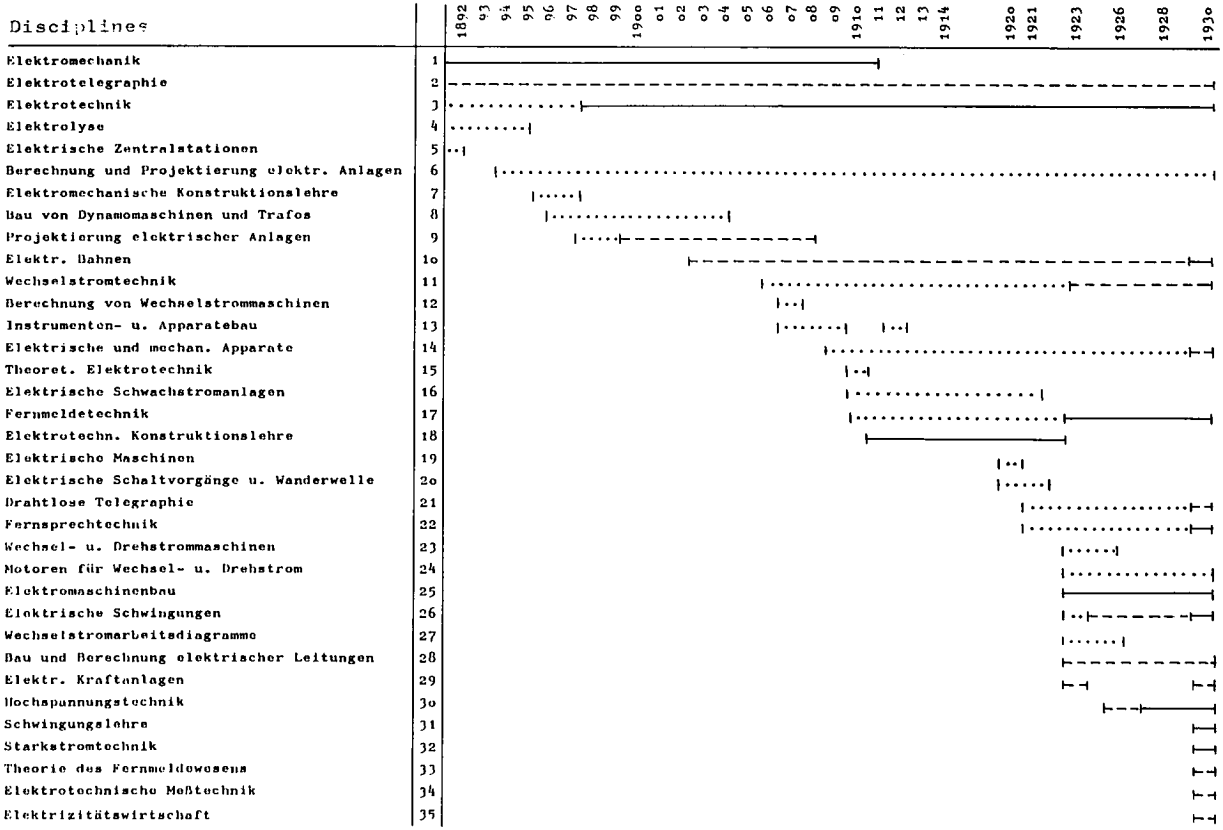
Taking into account research dynamics and generalized assumptions about usefulness and applicability, the differentiation processes within the natural sciences can be considered relatively modest (Table 6). At least at a German university, which was not the only institution to host the natural sciences, many full professors simply taught physics or chemistry, if only nominally. On the other hand, it is precisely in the natural sciences (and medicine), where the German research university found its strongest foothold. The apparent differences between the ranges of disciplines, on the rank level of full professor between medicine and the natural sciences (cf. Tables 5 and 6), probably stem from the very different labor markets for the two groups of professionals. In medicine we find an old established and very powerful profession which could use internal differentiation (or, if one prefers, "scientification" of various subject matters within medical care) for its professionalization policies. Hence there was a close relationship between an array of core disciplines and the range of medical specialists. For the natural sciences research may induce ever-growing specialization or disciplinary differentiation, but, with the exception of chemistry, there was no significant market for specialists outside the university, at least for a long time to come. Hence only a few core disciplines represent the traditional set of cognitive units which date back to the beginning of the century.

By contrast, differentiation processes are largest, at least if taken nominally, in the realm of technical sciences. Ferber deals with the technical sciences on the aggregate level only, that is by comparing, e.g., civil engineering with mechanical engineering, electrotechnology, etc. (cf. Table 3). On the basis of *Minerva,* such units can be broken down. This has been done for the technical university of Berlin, but confined to electrical engineering (Table 7). The prevailing picture is that of a few core disciplines for each kind of prospective engineering specialist and of an immense range of additional specialties, partly overlapping and often short-lived. To interpret these findings one may point to three interconnected circumstances: Professionalization policies of the engineers and special courses being taught by practitioners resemble the medical pattern. Unlike medicine, the technical sciences are institutionalized outside the university and therefore unhampered by traditional faculty boundaries. Moreover, the cognitive contents of the technical sciences are less sharply delineated and more open to nominal differentiation according to fields of practical technical work. Again we fall back on our basic distinction between disciplines as cognitive or institutional units. Any further discussion would require specifying the argumentation on a level of case studies which is clearly beyond the limits of this paper. Another dimension of disciplinary differentiation, however, can yet be added, and that is research.

The Institutionalization of Disciplinary Research:

The German university of the 19th century has often been praised as the model of the modern research university. Nevertheless, any comprehensive account of this historical development is still lacking. There is no book presenting basic data on research institutions such as Ferber's volume on teaching personnel. Under these circumstances any effort to describe disciplinary differentiation within the realm of research cannot be separated from a concomitant survey of institutionalization and growth of research at universities (and technical universities). Such an overview has been as-

Table 7: Disciplines within Electrical Engineering at Berlin Technical University, 1890–1930



Source: Minerva. Jahrbuch der gelehrten Welt

1st rank: full professor ——— 2nd rank: extraordinary professor ------ 3rd rank: Privatdozent ·····

sembled for the following tables by relying on three different types of sources: (1) The annual budget of the Prussian Ministry of Cultural Affairs.[12] It includes a listing of all institutions annexed to each Prussian university, including their budget and personnel. (2) A monograph on the history of Berlin university which offers historical accounts for each institute or seminar.[13] (3) A 1930 survey of all German research institutes in the realm of natural and technical sciences.[14].

The typical information from the Prussian annual budget can be organized on two different levels, by faculties or by disciplines. In order to present an overall impression it is necessary to begin on the aggregate level (Table 8). Comparing the four traditional faculties, research is relatively negligible in theology and law. Medicine and the natural sciences receive large shares of public expenditure and personnel employed, whereas the humanities are rich in seminars but poor in infrastructure. Even more remarkable are the differences between big and small universities, especially between Berlin and the rest. To put the data on research institutions into a developmental perspective (Fig. 1), one can speak of differential growth rates, with medical clinics and seminars in the humanities ahead of the other institutions since the turn of the century. These findings seem to support what has been said in regard to differentiation of teaching. If we relate personnel and public expenditure to the numbers of institutions, several observations can be made (Table 9): (1) Inter-university differences (Berlin vs. the mean) prevail throughout the time period under consideration. (2) In absolute terms, the number of researchers (assistants) seems fairly small, and consequently public expenditures, which include wages until 1910, are of minor size. (3) Relative growth over time appears to be modest, especially for the staffing of institutions.

The disciplinary level of analysis can only be examined for a few examples. In physics and chemistry, the typical Prussian university had just one institute for each field (Table 10). Exceptions are, for physics, Berlin with theoretical physics (1890) and Göttingen with geophysics (1905); and for chemistry, physical chemistry at Göttingen (1900), Berlin (1905) and Marburg (1931). The general impression suggests little formal differentiation, comparable to the findings regarding the denomination of chairs in these fields. Internally, however, a fair amount of differentiation may safely be supposed: First, the existence of heads of divisions points into this direction. Secondly, staffing and financing of research institutes in chemistry exceed the average for the natural sciences, both on the state level and at the University of Berlin (Table 11; cf. Table 9). Within the humanities, classical philology established the model of a seminar already in the late 18th century. Consequently, all Prussian universities have their respective seminar (Table 12). German philology, on the other hand, only achieved equal footing in terms of distribution by 1895. Typically, these seminars offered less than one assistantship per institution, except at Berlin (cf. Table 9).

Differential strength and growth within a given spectrum of research institutions has to be distinguished from disciplinary differentiation of the spectrum itself. Leav-

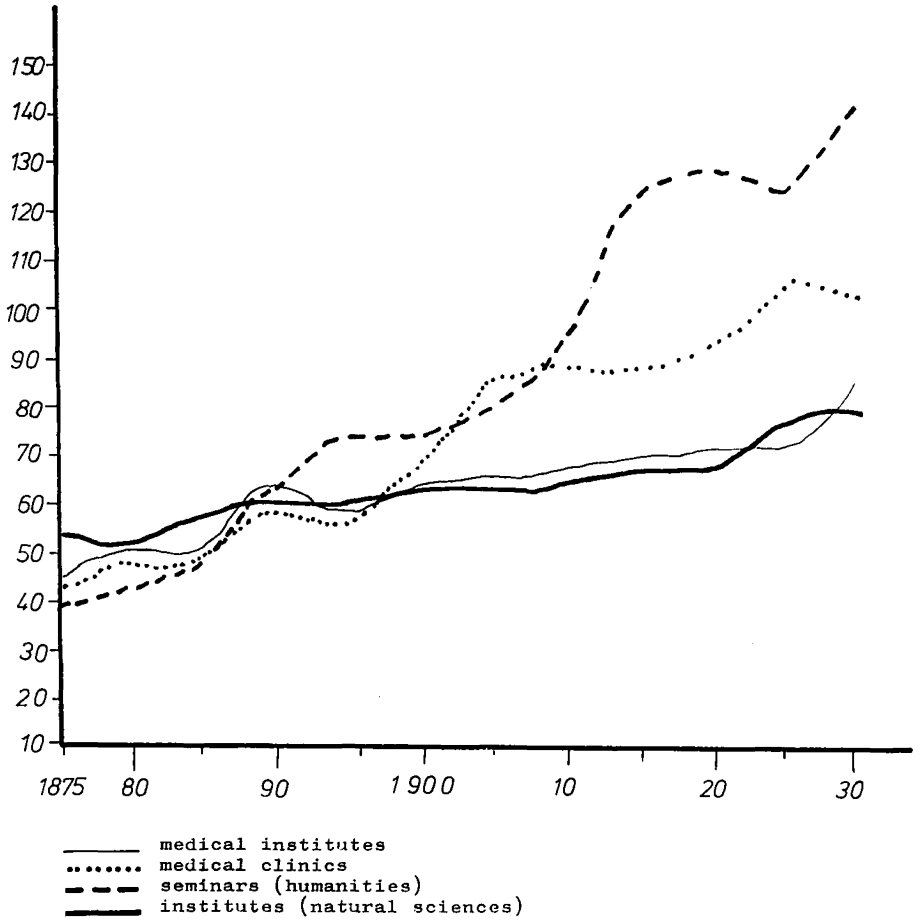
12. *Staatshaushalts-Etat für das Jahr 1870–1931* [Preussen] (Berlin 1870–1931).
13. Max Lenz, *Geschichte der Kgl. Friedrich-Wilhelms-Universität zu Berlin* (Berlin, 1910), vol. 3.
14. C. Boeck, *Die technisch-wissenschaftlichen Forschungsanstalten* (Berlin, 1931).

Table 8: Seminars, Institutes and Clinics at Prussian Universities, 1910

Universities	Theology			Law			Medicine						Philosophy					
							Institutes			Clinics			Humanities			Natural Sciences		
	Institutions	Public expenses	Academic personnel	Institutions	Public expenses	Academic personnel	Institutions	Public expenses	Academic personnel	Institutions	Public expenses	Academic personnel	Institutions	Public expenses	Academic personnel	Institutions	Public expenses	Academic personnel
Königsberg	1	580	1	2	800	-	7	65,449	18	7	282,952	27	7	15,510	5	4	50,675	11
Berlin	2	2,600	2	2	4,700	-	10	302,763	72	20	531,627	76	14	255,374	31	12	384,899	90
Greifswald	1	771	2	2	750	-	5	53,310	15	7	291,301	32	5	2,020	-	4	40,188	12
Breslau	3	2,275	-	2	1,000	-	6	100,313	27	8	387,206	55	9	17,450	5	5	66,701	17
Halle	1	-	-	2	1,200	-	5	61,247	18	8	287,861	51	8	14,110	4	4	64,491	17
Kiel	2	891	1	2	1,000	-	6	70,168	20	9	335,777	44	6	9,290	2	3	27,690	8
Göttingen	1	4,280	-	2	1,200	-	7	61,109	14	6	206,936	22	9	20,388	6	7	98,611	26
Marburg	1	900	-	2	860	-	6	92,941	26	5	201,083	23	8	15,206	4	6	101,735	24
Bonn	2	1,200	-	3	1,800	-	6	74,870	21	7	280,668	37	9	22,880	9	4	75,010	24
Münster	1	600	-	2	1,200	-	-	-	-	-	-	-	5	1,700	-	5	54,691	17
Total	15	14,097	6	21	14,510	-	58	882,143	231	77	2,805,411	367	80	373,928	66	54	964,691	246

Source: Staatshaushalts-Etat, 1910

Figure 1: Seminars, Institutes and Clinics in Medicine and Philosophy at Prussian Universities, 1875–1930



Source: Staatshaushalts-Etat, 1875–1931

ing aside the case of internal specialization under the cover of a nominally monodisciplinary institution, we probe the gradual widening of the range of such institutions. In order to extend the time span back to the beginning of the 19th century, the history of the University of Berlin (founded in 1810) serves as a useful example. Judged by the chronological sequence of their establishment, medical clinics dominate the

Table 9: Research Personnel and Expenditure in Medicine and Philosophy at Prussian Universities, 1875-1930, per Institution

(a) academic personnel

Year	Medicine				Philosophy			
	institutes		clinics		humanities		sciences	
	Prussia	Berlin	Prussia	Berlin	Prussia	Berlin	Prussia	Berlin
1875	3.6	6.3	2.9	1.3	0.5	0.0	1.7	2.0
1880	3.6	6.2	3.8	1.7	0.4	0.0	2.2	2.8
1885	3.7	5.7	4.6	4.3	0.6	0.0	2.5	4.3
1890	2.8	5.9	4.1	3.2	0.8	1.9	2.8	3.8
1895	3.4	5.8	4.7	3.1	0.8	2.3	3.0	3.9
1900	3.4	5.9	4.5	3.1	0.9	2.9	3.7	5.4
1905	3.9	6.9	4.2	2.9	0.9	2.4	4.0	6.8
1910	4.0	7.2	4.8	3.8	0.8	2.2	4.6	7.5
1915	4.2	7.8	5.3	5.1	0.6	2.1	4.8	8.5
1920	4.0	7.9	5.1	5.0	0.6	1.9	4.9	8.0
1925	4.0	8.6	5.4	6.2	0.6	1.6	3.9	4.9
1931	3.6	7.7	5.5	5.8	0.7	2.1	4.4	7.5

(b) public expenditure

Year	Medicine				Philosophy			
	institutes		clinics		humanities		sciences	
	Prussia	Berlin	Prussia	Berlin	Prussia	Berlin	Prussia	Berlin
1875	11,590	18,195	15,343	4,433	1,101	2,040	5,526	11,347
1880	12,391	28,602	15,311	4,845	1,008	1,395	7,065	14,614
1885	13,240	24,891	28,017	25,530	1,351	1,380	8,947	22,382
1890	9,089	23,541	26,526	20,032	3,102	12,057	8,669	15,406
1895	10,616	22,203	41,151	19,608	3,343	15,008	10,855	18,227
1900	11,420	22,406	30,097	19,428	3,804	17,989	12,104	22,006
1905	13,708	27,791	30,186	18,680	4,270	16,569	14,741	26,471
1910	15,209	30,276	36,433	26,581	4,674	18,241	17,865	32,079
1915	10,734	23,736	35,732	26,292	1,738	4,503	11,418	20,640
1920	10,581	24,146	32,158	26,225	1,648	4,112	12,015	20,215
1925	12,093	36,450	26,718	24,009	1,648	3,281	10,292	15,024
1931	15,797	32,939	27,028	24,712	3,608	6,277	18,204	30,100

Source: Staatshaushalts-Etat, 1875-1931

Table 10: Physics and Chemistry Institutes at Prussian Universities, 1875–1930

(a) physics

Year	Number	budget		personnel		
		public expenses	institutional revenue	head of division	assistants	auxiliary personnel
1875	12	43,521			7	11
1880	10	69,519			11	13
1885	10	76,051			15	13
1890	11	96,587	460		19	11
1895	11	102,470			19	11
1900	11	120,770			21	14
1905	12	152,580			26	15
1910	12	172,215		2	29	14
1915	12	150,101		1	35	12
1920	12	165,751	5.400	1	36	12
1925	12	149,700		1	36	14
1931	14	251,250	1.700	1	36	14

(b) chemistry

Year	Number	budget		personnel		
		public expenses	institutional revenue	head of division	assistants	auxiliary personnel
1870	11	79,529				
1875	11	120,889			27	15
1880	11	145,097	750		30	18
1885	12	160,704	4,853		34	18
1890	11	172,627	9,049		37	20
1895	11	206,307	1,521		41	22
1900	12	281,171	1,190		49	31
1905	13	324,783	4,448		54	34
1910	13	395,417	6,925	20	58	34
1915	13	281,177	12,361	22	63	35
1920	13	263,342	35,938	22	64	35
1925	13	307,650	900	22	63	31
1931	14	535,700	21,070	22	61	30

Source: Staatshaushalts-Etat, 1870-1931

early decades, and their differentiation proceeds fairly gradually (Table 13). By 1890, there are even specialized institutions for fields which are not yet represented by a full professor (e.g., dentistry, orthopedic surgery, pulmonary diseases, venereal diseases) (cf. Table 5). Medical therapeutics is sometimes ahead of medical teaching in terms of specialization. This applies even more to medical research such as radiology and neurobiology.

Table 11: Personnel and Expenditure for Physics and Chemistry Institutes at Prussian Universities, 1875–1930

Year	physics				chemistry			
	academic personnel		public expenditure		academic personnel		public expenditure	
	Prussia	Berlin	Prussia	Berlin	Prussia	Berlin	Prussia	Berlin
1875	1.7	2.0	3,627	11,415	2.5	4.0	10,989	20,367
1880	1.1	3.0	6,952	27,854	2.7	4.0	13,190	20,572
1885	1.5	3.0	7,605	27,860	2.8	3.5	13,392	19,550
1890	1.7	2.5	8,781	15,445	3.4	3.5	15,693	20,067
1895	1.7	2.5	9,315	15,824	3.7	4.0	18,755	22,415
1900	1.9	2.5	10,979	17,409	4.1	5.5	23,431	48,617
1905	2.2	2.5	12,715	16,709	4.2	5.5	24,983	49,832
1910	2.6	3.0	14,351	20,184	6.0	7.5	30,417	54,625
1915	3.0	3.5	12,508	15,487	6.5	7.5	21,629	39,775
1920	3.1	3.5	13,813	15,487	6.6	7.5	20,257	32,058
1925	3.1	3.5	12,475	15,525	6.5	7.5	23,665	41,625
1931	2.6	3.0	17,946	20,900	5.9	7.5	41,207	70,200

Source: Staatshaushalts-Etat, 1875-1931

Table 12: Seminars for Classical and German Philology at Prussian Universities, 1875-1930

(a) classical philology

Year	Number	budget		personnel		
		public expenses	institutional revenue	director	assistants	auxiliary personnel
187o	1o	11,22o	-	8	-	-
1875	1o	13,89o	-	8	-	-
188o	1o	14,34o	-	8	-	-
1885	1o	15,24o	-	9	-	-
189o	1o	9,17o	-	8	-	-
1895	1o	7,35o	-	7	-	-
19oo	1o	1o,o35	-	3	3	-
19o5	9	1o,56o	-	3	4	-
191o	9	13,12o	-	-	5	-
1915	9	6,18o	83o	-	5	-
192o	9	6,18o	887	-	5	-
1925	8	6,15o	-	-	7	-
1931	5	9,6oo	1,3oo	-	4	-

(b) German philology

Year	Number	budget		personnel		
		public expenses	institutional revenue	director	assistants	auxiliary personnel
187o	-					
1875	2	6oo	-	-	-	-
188o	5	1,5oo	-	-	-	-
1885	5	1,5oo	-	-	-	-
189o	8	2,38o	-	-	-	-
1895	1o	3,18o	-	-	-	-
19oo	1o	3,18o	-	-	-	-
19o5	1o	3,78o	-	-	-	-
191o	1o	3,78o	-	-	-	-
1915	1o	3,78o	2,435	-	-	-
192o	1o	3,98o	4,589	-	-	-
1925	1o	4,2oo	-	-	1	-
1931	1o	27,5oo	5,69o	-	2	-

Source: Staatshaushalts-Etat, 1870-1931

Table 13: Medical Clinics and Institutes at the University of Berlin, 1810–1909

(a) clinics

Institution	1810/19	1820/29	1830/39	1840/49	1850/59	1860/69	1870/79	1880/89	1890/99	1900/09
Univ.:										
Klin.Institut f. Chirugie	—	—	—	—	—	—	—	—	—	—
Klin. f. Frauenkrankheiten und Geburtshilfe	—	—	—	—	—	—	—	—	—	—
Poliklin.Institut f. innere Medizin	—	—	—	—	—	—	—	—	—	—
Augenklinik						—	—	—	—	—
Klinik f. Ohrenkrankheiten							—	—	—	—
Klinik f. Hals- u.Nasenkranke								—	—	—
Zahnärztl. Institut								—	—	—
Poliklinik f. orthopäd.Chirugie									—	—
Poliklinik f. Lungenleiden									—	—
Hydrotherapeut. Anstalt										—
Ambulatorium f.Sprachstörungen										—
Mechanotherapeut. Anstalt										—
Charité:										
Chirurg. Klinik u. Poliklinik	—	—	—	—	—	—	—	—	—	—
Erste medizin. Klinik	—	—	—	—	—	—	—	—	—	—
Psychiatr. u. Nervenklinik	—	—	—	—	—	—	—	—	—	—
Klinik f. Haut-u.Geschlechtsk.		—	—	—	—	—	—	—	—	—
Klinik f. Kinderkrankheiten			—	—	—	—	—	—	—	—
Frauenklinik					—	—	—	—	—	—
Zweite medizin. Klinik					—	—	—	—	—	—
Klinik f. Augenheilkunde									—	—
Klinik f. Hals-u. Nasenkranke									—	—
Klinik f. Ohrenkrankheiten									—	—
Inst. f. Krebsforschung										—
Total	6	7	8	8	10	11	12	14	19	23

(b) institutes

Institution	1810/19	1820/29	1830/39	1840/49	1850/59	1860/69	1870/79	1880/89	1890/99	1900/09
Anatomisches Institut	—	—	—	—	—	—	—	—	—	—
Pharmakologisches Institut				—	—	—	—	—	—	—
Physiologisches Institut					—	—	—	—	—	—
Pathologisches Institut					—	—	—	—	—	—
Anatom.-biolog. Institut								—	—	—
Hygienisches Institut								—	—	—
Inst. f. Unters. mit Röntgenstrahlen									—	—
Neuro-biolog. Laboratorium										—
Total	1	1	1	2	4	4	4	6	7	8

Source: Lenz, 1910

Within the faculty of philosophy, the natural sciences witness a steep rise in disciplinary research units only after 1860. They are followed two decades later by the humanities which display a similar pattern of differentiation (Table 14). By the end of the 19th century, the respective range of teaching subjects on the rank level of full professor coincides rather closely with research institutes (cf. Table 6). Sometimes, teaching is more differentiated than are the seminars which obviously host clusters of related disciplines. This practice seems to be appropriate for the humanities, but one might have expected a greater degree of disciplinary differentiation within the natural sciences. Of course, intra-institutional specialization and division of labor needs to be taken into account. Moreover, there may be more differentiation in the 20th century. Finally, however, traditional faculty boundaries may have blocked further external differentiation. The last two points can be checked, if research institutes for the natural and technical sciences at all German universities and technical universities are compared.

The following survey is based on Boeck who in 1931 published a handbook listing all then existing research institutes in basic and applied sciences (excluding biology). He included institutions whether they were part of universities and other academic institutions, or run by public authorities, by private industry, by associations or by foundations. Those annexed to universities or technical universities have been sampled and ordered according to the sequence of their foundation as well as according to disciplinary boundaries (by various degrees of specification). An overview, put into very broad categories, suggests two basic facts (Fig. 2): (1) Research institutes for the natural sciences are nearly as strongly represented at the German technical universities as at the universities proper, although the latter outnumber the former by 2:1. (2) Research institutes for the technical sciences follow closely their sisters in the natural sciences at the technical universities until about 1900, when an immense growth, probably accompanied by differentiation, carries them far ahead.

Broken down by disciplines, two different developments can be discerned with respect to research institutes for the natural sciences (Table 15): (1) Much of the growth is attributable to inter-university differentiation. In other words, minimal standards in terms of established institutes rise and generalize. This holds true both for universities and for technical universities. (2) Additional growth goes back to disciplinary differentiation (e.g., technical physics, mechanics) for both sets of institutions. Most interesting is the case of chemistry. The traditional bifurcation between inorganic and organic chemistry was followed by an external institutional separation almost exclusively at the technical universities. These findings support our assumption that non-university institutions, lacking traditional faculty organization, were more open to institutional change or disciplinary differentiation on a nominal, i.e., institutional scale.

Turning to the technical sciences one might expect an even higher degree of institutional differentiation along disciplinary lines, in accordance with the pattern prevailing in teaching (cf. Table 7). Indeed this was the case, and probably continues to be (Tables 16–17). As has been noted earlier, growth rates explode after the turn of the century, and we find many specialties which are equipped with research institutes after this time (e.g., automobile and aircraft-construction, shipbuilding). In other instances, established research fields spread to the various technical universities (e.g., metallurgy, material testing, geodetics). Generally, some sort of "scientification"

Table 14: Philosophical Institutes and Seminars at the University of Berlin, 1810–1909

(a) sciences

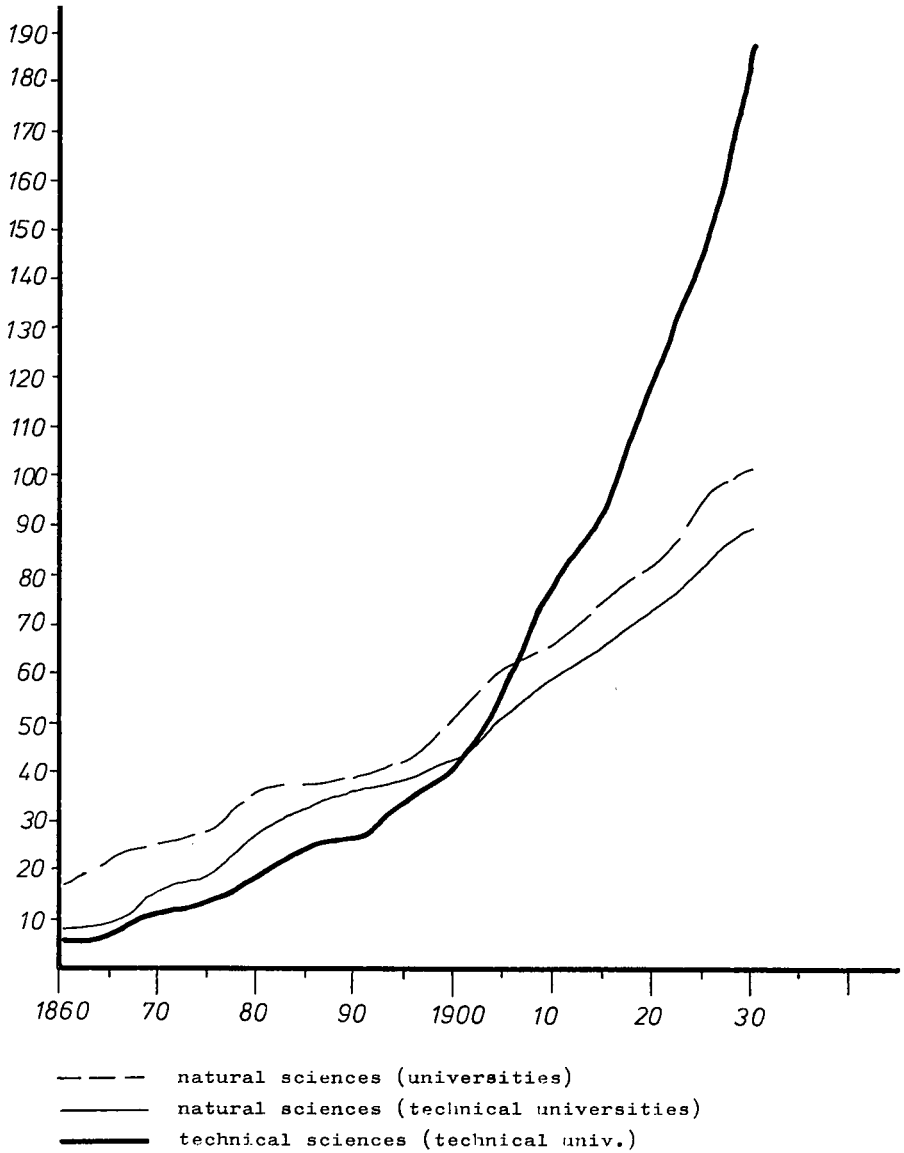
Institution	1810/19	1820/29	1830/39	1840/49	1850/59	1860/69	1870/79	1880/89	1890/99	1900/09
Sternwarte										
Zoologisches Museum										
Universitätsgarten, Bot. Garten										
Physikalisches Institut										
Chemisches Institut										
Mathemat. Seminar										
Seminar z. Ausbildung im wiss. Rechnen										
Botanisches Institut										
Pflanzenphysiolog. Inst.										
Astronom.Rechen-Institut										
Institut f. theoret.Physik										
Geograph. Institut										
Mineralog.-petrograph.Inst.										
Geolog.-paläontolog.Inst.										
Zoologisches Institut										
Technologisches Institut										
Meteorologisches Institut										
Botanisches Museum										
Physikal.-chem. Institut										
Inst. f. Meereskunde										
Pharmazeut. Institut										
Total	2	3	4	4	4	6	10	17	18	21

(b) humanities

Institution	1810/19	1820/29	1830/39	1840/49	1850/59	1860/69	1870/79	1880/89	1890/99	1900/09
Philologisches Seminar	—	—	—	—	—	—	—	—	—	—
Archäologischer Apparat					—	—	—	—	—	—
Apparat f. neuere Kunstgeschichte							—	—	—	—
Institut f. Altertumskunde								—	—	—
Germanisches Seminar								—	—	—
Seminar f. oriental. Sprachen								—	—	—
Historisches Seminar								—	—	—
Staatswiss.-statist. Sem.								—	—	—
Seminar f. roman. Philologie									—	—
Seminar f. engl. Philologie									—	—
Seminar f. histor. Geographie									—	—
Psychologisches Institut									—	—
Philosophisches Seminar										—
Indogerm. Seminar										—
Seminar f. osteurop. Geschichte										—
Musikhistor. Seminar										—
Total	1	1	1	1	2	2	3	8	12	16

Source: Lenz, 1910

Figure 2: Natural Science and Technical Institutes at German Universities and Technical Universities, 1860–1930



Source: Boeck, 1931

Table 15: Natural Science Institutes at German Universities and Technical Universities, 1860–1930

(a) natural sciences

Year	Chemistry (total)		Physics		Technical physics		Mechanics		Geology, mineralogy		Agricultural biology		Agricultural technology		Food-stuffs	
	Uni	TH	Uni	TH	Uni	TH	Uni	TH	Uni	TH	Uni	TH	Uni	TH	Uni	TH
1860	4	4	6	2					6	1				1	1	
1865	6	4	8	2					7	1		1		1	1	
1870	7	8	8	3					7	2	1	1	1	1	1	1
1875	9	9	8	3					7	3	2	2	1	1	1	1
1880	13	14	10	4					9	4	2	3	1	1	1	2
1885	13	16	10	5					10	4	2	3	1	2	1	3
1890	14	18	11	5					10	4	2	3	1	3	1	3
1895	15	20	12	5					11	5	3	3	1	3	1	3
1900	19	22	15	5					13	6	4	3	1	3	1	3
1905	21	26	17	6	1	1	1		14	7	4	3	1	4	2	4
1910	22	32	17	7	1	1	1		18	8	4	3	1	4	2	4
1915	25	34	18	7	2	1	1	2	22	8	4	5	1	5	2	4
1920	28	36	18	8	2	2	1	2	24	8	5	5	2	6	2	5
1925	30	39	21	10	4	2	1	3	26	8	6	5	3	8	5	6
1930	32	39	23	13	5	4	1	5	26	10	6	5	3	8	5	6

(b) chemistry

Year	Chemistry											
	total		inorganic and organic		inorganic		organic		physical, electro		technical	
	Uni	TH	Uni	TH	Uni	TH	Uni	TH	Uni	TH	Uni	TH
1860	4	4	4	1		2						1
1865	6	4	6	1		2						1
1870	7	8	7	1		4		1				2
1875	9	9	8	1		4		1	1			3
1880	13	14	9	1	1	5		3	3	1		4
1885	13	16	9	2	1	5		4	3	1		4
1890	14	18	10	2	1	5		4	3	2		5
1895	15	20	10	2	1	6		5	4	2		5
1900	19	22	10	3	1	6		5	6	3	2	5
1905	21	26	10	3	2	6		6	6	5	3	6
1910	22	32	11	3	2	7		7	6	7	3	8
1915	25	34	12	3	2	7		8	8	8	3	8
1920	28	36	12	3	2	7		9	10	9	4	8
1925	30	39	12	3	2	7		9	11	9	5	11
1930	32	39	12	3	2	7		9	13	9	5	11

Source: Boeck, 1931

Table 16: Technical Institutes at German Technical Universities, 1860–1930

I

Mining, Metallurgy, Materials, Processing Technologies

Year	Mining, Metallurgy, Metal processing					
	total	mining	metallurgy	metallography	mechanical technology	material testing
1860	2	1		1		
1865	2	1		1		
1870	3	1		1		1
1875	4	1	1	1		1
1880	7	2	2	1		2
1885	9	3	2	1		3
1890	9	3	2	1		3
1895	11	4	2	1		4
1900	12	4	2	2		4
1905	14	4	2	3		5
1910	24	6	3	7	1	7
1915	27	7	4	8	1	7
1920	35	12	4	9	1	9
1925	40	15	4	9	2	10
1930	44	17	5	9	3	10

Year	Materials and processing technologies								
	total	fuels	building materials	textile technol.	paper technol.	photo technol.	glass technology	painting technology	welding technology
1860									
1865									
1870									
1875									
1880	2			1		1			
1885	3			1		1		1	
1890	3			1		1		1	
1895	5			2	1	1		1	
1900	5			2	1	1		1	
1905	8			2	3	2		1	
1910	9			2	3	3		1	
1915	13			3	4	4	1	1	
1920	20	3	2	4	4	5	1	1	
1925	25	4	2	4	4	6	2	1	2
1930	30	6	2	4	4	7	3	1	3

Source: Boeck, 1931

within many fields of technical practice seems to gain speed. For example, the various materials and their processing technologies get specific research institutions (Table 16). Similarly machine building is specialized very early for steam engines, later for automobiles, aircraft and shipbuilding (Table 17).

If one goes beyond the disciplinary categories used by Boeck, an even greater degree of differentiation is evident. A listing like that of the research institutions in electrical engineering (Table 18) displays both inter-university differences and disciplinary specialization over time. On the other hand, seven research institutes for electrical engineering at the technical university of Berlin constrast sharply with the unstable range of specialties prevailing in teaching (cf. Table 7). It might not be too

Table 17: Technical Institutes at German Technical Universities, 1860-1930
II
Engineering, Construction, Surveying

Year	civil engineering, machine building, construction							
	total	civil engineering	machine building	steam engine	shipbuilding	aircraft construction	automobile construction	transportation
1860	1		1					
1865	1		1					
1970	1		1					
1875	2		1	1				
1880	3		2	1				
1885	3		2	1				
1890	4		3	1				
1895	5		4	1				
1900	10	1	8	1				
1905	19	6	10	1			1	1
1910	26	7	16	1			1	1
1915	30	9	18	1			1	1
1920	38	10	21	2		2	2	1
1925	44	10	25	2		2	2	3
1930	64	20	29	2	1	3	4	5

Year		energy technology; surveying				
	total	electrical engineering	light technology	heat and refrigerating technology	geodesy	techniques of measurement
1860					3	
1865					4	
1870					7	
1875					7	
1880					7	
1885	3	3			7	
1890	4	4			7	
1895	7	7			7	
1900	8	8			7	
1905	9	9			7	
1910	13	13			8	
1915	15	15			8	
1920	19	18	1		8	
1925	27	24	2	1	8	1
1930	38	34	2	2	8	1

Source: Boeck, 1931

Table 18: Electrical Engineering Institutes at German Universities and Technical Universities, 1882–1931

Academic institutions	Institutes for electrical engineering	
	Foundation	Name (of 1930)
TH Aachen	1883	Elektrotechn. Institut
	1910	Elektrotechn. Versuchsfeld
TH Berlin		Elektrotechn. Laboratorium
	1906	Elektrotechn. Versuchsfeld
	1911	Lab. für Fernmeldetechnik, Werk- u. Gerätebau
	1926	Hochspannungs-Institut
	1926	Inst. f. Elektr. Schwingungslehre u. Hochfrequenztechnik
	1927	H. Hertz-Institut f. Schwingungsforschung
	1927	Forschungsinstitut f. Schaltungen u. Getriebe
Univ. Bonn	1922	Röntgen-Forschungs-Institut
TH Braunschweig	1890	Inst. f. elektr. Meßkunde u. Hochspannungstechnik
	1920	Institut für elektr. Maschinen
	1921	Institut für techn. Elektronik
	1927	Inst. f. Fernmelde- u. Hochfrequenztechnik
TH Breslau	1910	Elektrotechn. Institut
TH Darmstadt	1882	Elektrotechn. Institut
	1906	Institut für Fernmeldetechnik
	1907	Hochspannungs-Laboratorium
	1911	Institut für Schwachstromtechnik
	1928	Röntgen-Institut
TH Dresden	1885	Elektrotechn. Institut Inst. f. Telegraphie u. Eisenbahnsignalwesen
	1920	Institut f. Starkstrom- u. Hochspannungstechnik
	1924	Lab. f. angewandte Röntgenographie
BA Freiberg	1885	Elektrotechn. Institut
Univ. Göttingen	1895	Institut für angewandte Elektrizität
TH Hannover	1884	Elektrotechn. Institut I Grundlagen der Elektrotechnik und Hochspannungstechnik II Elektrische Maschinen III Elektr. Anlagen u. Bahnen, Elektrowärmetechnik IV Elektr. Meßtechnik u. Fernmeldetechnik
	1923	Institut für Hochfrequenzphysik
	1924	Lab. f. elektr. Meß- u. Fernmeldetechnik
	1928	Forschungsinstitut für Elektrowärmetechnik
TH Karlsruhe	1896	Elektrotechn. Institut
	1928	Hochspannungsinstitut
TH München	1895	Elektrotechn. Institut
	1923	Hochspannungs-Lab.
	1924	Elektrophysikalisches Lab.
TH Stuttgart	1895	Elektrotechn. Institut
	1919	Röntgen-Lab.

Source: Boeck, 1931

far off to conclude that at least in the realm of technical sciences it is sometimes the research institutes which combine cognitive substance and social organization of disciplines, whereas teaching follows somewhat different paths of specialization. Whether findings and suggestions of this sort hold true must be left to future research along two lines: Cross-national comparisons on the macro-level; and case studies for disciplinary clusters. It is mainly on these levels that we can also hope to find answers to some other questions only occasionally addressed, which center around the *causes* of scientific differentiation. At this point the following causes can tentatively be linked to some major findings for the sake of a brief summary:

(1) A high degree of differentiation within teaching of the humanities seems attributable to the cultural and historical predilections of a wealthy bourgeosie interested in the liberal arts as a token of sophisticated consumption, available even to female students at a relatively early date.

(2) The natural sciences displayed less differentiation than expected, both in teaching and in research, compared to medicine and to the technical sciences. Two possible causative factors have been suggested in explanation. Differences in the labor market for academics may lead to a "scientification" of subject-matter handled by academic practitioners (physicians, engineers), whether determined by the "need" for more scientific knowledge or by social strategies of professionalization. Differences in the rigidity or flexibility of institutional boundaries may facilitate differentiation in the case of the technical sciences.

(3) Attention has frequently been paid to the differences between cognitive and institutional criteria of differentiation. It could well be that disciplinary differentiation is only poorly mirrored by intra-university indicators such as teaching and research. However, our findings seem to corroborate the existence of major differences between science, medicine and technology which have also been suggested by indicators appropriate for the cognitive-communicative entity of disciplines.[15] According to citation analyses, sciences are said to be prone to publishing, which leads towards a cumulative, close-knit structure by "research-front citation." On the other hand, technology does not grow cumulatively by paying attention to research-fronts enshrined in literature. Rather, technological research-fronts center around a "state of the art" familiar to a school of practitioners. Medicine, it is noted, goes both ways in that it is partly scientific, partly technological (or practical, i.e., clinical). It is tempting to visualize a decreasing order of powerful theoretical paradigms (or theories, or research programs) which might determine the increasing degree of cognitive differentiation within the sciences, medicine, and technology, and which might contribute to the respective degrees of differentiation within institutions of higher learning.

15. Derek I. de Solla Price, "Is Technology Historically Independent of Science? A Study in Statistical Historiography," in: *Technology and Culture*, 6 (1965), 553–568.

James C. McClelland

Diversification in Russian-Soviet Education

Characteristics of Tsarist Education:

The Russian higher educational network in the 19th century exhibited three major characteristics that directly influenced the process of institutional diversification. The first was the pre-eminence within the entire educational system of the research university based on the German model. To be sure, the country had a number of technical institutes with high standards (including an Institute of Transportation Engineers which had been modeled on the *Ecole Polytechnique*), but these in general had less prestige than the universities. What is striking is the extent to which autocratic education officials as well as members of the professoriate each accepted, though for different reasons, the ideal of a university system devoted to pure research in non-utilitarian areas of higher learning. Professors thought that the pursuit of science and learning was a sublime activity in its own right and one which furthermore would lead to a liberalization of the autocratic system and the Russian social structure. The two most important 19th-century ministers of education, S. S. Uvarov (1833–49) and D. A. Tolstoi (1866–1880), believed that a research-oriented university network with rigorous academic standards would add to Russia's prestige in the eyes of Europe, would produce the steady supply of hardworking, educated officials needed by the state and would avoid the pitfalls of exposing the students to politically dangerous topics and doctrines. The German influence also predominated at the secondary level, where (aside from theological seminaries) the most important institutions were the classical gymnasium, which had the exclusive right to prepare pupils for university study, and the less prestigious realschule, which sent many of its graduates to the technical institutes.

These institutions were not, of course, exactly identical with their German counterparts. The most important difference at the university level was the lack of theological faculties in Russia, which in the late 19th century accounted for 10% to 20% of the total enrollments of German universities.[1] The vast majority of the Russian clergy re-

1. Fritz K. Ringer, *Education and Society in Modern Europe* (Bloomington and London, 1979), 295.

ceived no higher education, although the Church administered a separate network of theological academies for a select number of students.[2] Russian universities did have the traditional law and medical faculties, and after 1863 the philosophy faculty was subdivided into two separate faculties, one for history and philology, the other for the physical sciences and mathematics.

The second major characteristic of Russian higher education was strong administrative control by the central government. On this point the Russian system more closely approximated the French than the German. Universities were under the jurisdiction of the Ministry of Public Education, and all except those in the non-Russian cities of Dorpat (Iur'ev), Helsinki and Warsaw were required to conform to a single uniform charter. This charter was changed three times during the 19th century with the last version, adopted in 1884, containing the most extensive provisions for governmental control of university activities. Under the provisions of the 1884 charter, rectors and deans were appointed by the Ministry of Education rather than elected by the professoriate, student organizations were banned and control over student discipline was entrusted to government-appointed officials, students in a given field were required to take a prescribed schedule of courses which had been drawn up by the appropriate faculty but approved by the ministry, and graduating seniors were required to take examinations given by the state.

Did this highly restrictive charter have a negative impact on the research productivity of Russian universities? To put the question more broadly, do centralized governmental controls in general contradict the very spirit of scientific and scholarly creativity? Russian academics were quick to answer in the affirmative and to attack the 1884 charter as a serious impediment to their work. The free pursuit of knowledge, they argued, is inherently incompatible with governmental controls and requires, on the contrary, complete university autonomy.[3] More recently the sociologists Joseph Ben-David and Awraham Zloczower, in a study that did not include Tsarist Russia, also found a direct correlation between a non-restrictive type of university organization and research productivity. In their view, it was not necessarily the autonomous structure of the individual university that stimulated fruitful research, but rather the decentralization, flexibility and competitiveness within the university system as a whole. They found these conditions—and impressive research results—present in the German states during the first half of the 19th century (though diminishing thereafter), absent in England due to the stifling influence of Oxbridge and present in late 19th-century America.[4]

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2. There were somewhat over 1,200 students in theological academies in 1914/15, which was about one percent of the enrollments of all higher educational institutions. If theology enrollments were added to university enrollments, they would represent three percent of the number of university and theology students. (*Trudy Tsentral'nogo Statisticheskogo Upravleniia*, 35 vols. [Moscow, 1920–28], vol. 28, pt. 1, *Narodnoe obrazovanie v SSSR* [1926], 518–19. Hereafter referred to as *Trudy*.)
3. N. I. Pirogov had eloquently stated this position in 1863 ("Universitetskii vopros," reprinted in N. I. Pirogov, *Izbrannye pedagogicheskie sochineniia* [Moscow, 1952], 380–463), and it remained an article of faith of the liberal professoriate until after the Bolshevik Revolution.
4. Joseph Ben-David and Awraham Zloczower, "Universities and Academic Systems in Modern Societies," *Archives europeennes de sociologie*, 3 (1962), 45–84.

The Russian experience during the decades following the adoption of the 1884 university charter does not validate either of these views, for Russian science and scholarship continued to flourish during this period despite the fact that it marked the nadir of university autonomy, the zenith of centralized control, and witnessed precious little flexibility or competitiveness among educational institutions. Indeed, it is possible that the government's heavy-handed policies may actually have stimulated pure research. Finding the possibilities for public-spirited activities and university administrative work severely limited, many academics may, as a result, have redoubled their efforts in research, one of the few channels for creative energies left open to them. This is one of several instances in which peculiarly Russian political and cultural conditions combined to produce educational results that were significantly different in Russia than elsewhere.[5]

The impact of centralized governmental control was mitigated to a certain extent by the fact that jurisdiction over educational institutions was shared by several governmental organs having varying outlooks and priorities. The Ministry of Education was, of course, the most important, with control over all of the universities and some of the lyceums and specialized institutes. But other ministries, including those of finance and communications, maintained their own higher educational institutions. The army administered one of the best medical schools in the country as well as several military academies and a network of secondary and primary institutions. The Orthodox Church was also active in the educational field, although primarily at the lower levels. This jurisdictional diversification meant that the Ministry of Education was able to impose a monolithic pattern only on those schools within its own jurisdiction. Consequently, a limited variety of approaches can be detected in the curricula and administrative structure of other schools. But it did not violate the fundamental principle that all educational institutions should be directly supervised by central governmental agencies. Local public and private groups were discouraged from taking the initiative in establishing schools, and in those cases where they were permitted to do so, the resulting schools were required to conform to detailed regulations handed down by the Ministry of Education.

The third major characteristic of 19th-century Russian education was its combination of relative strength at the higher educational level coupled with extreme weakness at the primary level. A consideration of this characteristic will go beyond the focus of this volume on higher education itself, but it is clear that an understanding of the ways in which a higher educational system is related to the primary and secondary sectors is essential to an adequate appraisal of its impact on society as a whole. Russia differed in this respect from every other country in the world, which makes an examination of the causes and consequences of her educational imbalance all the more important.

There are a number of reasons why the tsars and their advisers showed more concern for higher than primary education during the 19th century. The size and poverty of the empire, the weakness of the local governmental apparatus, the absence or au-

5. This point is developed further in my unpublished paper, "The Mystique of *Nauka:* Science and Scholarship in the Service of the People." See also V. I. Vernadskii, "1911 god v istorii russkoi umstvennoi kul'tury," *Ezhegodnik gazety Rech' na 1912 god* (St. Petersburg, 1912), 327–28.

tocratic distrust of local groups and individuals willing and able to establish and staff primary schools, the intellectual weakness of the Church, the government's fear that widespread education would be politically dangerous and, perhaps most importantly, the belief that the country's main need was for a relatively small number of highly trained personnel rather than a literate citizenry as a whole, all served to reinforce this tendency. The result was that in 1900 only two European countries (Serbia and Portugal) had a higher rate of illiteracy than Russia.[6] But Serbia and Portugal, unlike Russia, did not have a university system that was beginning to produce internationally known scholars and scientists. All the other countries which possessed well-developed higher education systems, on the other hand, had either attained or were approaching universal literacy by the end of the century. Russia thus stands alone in terms of her contrast between a creditable higher educational system and an abysmally developed primary sector.[7] The top-heavy Russian educational edifice rested on a precariously narrow base.

Two probable consequences of this severe imbalance between the higher and primary sectors should be noted at this point. A consciousness of their highly privileged status and of the vast chasm between themselves and the illiterate mass of the population may have been one contributing factor in the development of liberal and radical ideologies among professors and students, in contrast to the illiberalism of the right that came to flourish in German academic circles. But despite the pervasiveness of these ideologies among educated Russians, the emphasis of the state on extensive education for a few rather than modest schooling for the many must in reality have widened rather than narrowed the distance between the still-illiterate peasantry and the increasingly educated urban dwellers. It is more than likely that the extremely unequal distribution of education was sharpening social differences and antagonisms more rapidly than liberal or radical rhetoric was able to bridge or ameliorate them.

To what extent did the subsequent development of higher education in Russia produce changes or modifications in the three characteristics just discussed? Within the broad period of 1860–1930, two major turning points suggest themselves. The turn of the century ushered in a vibrant period of educational expansion which led to a slight diminution in the pre-eminence of the university and the central control of the government, while actually intensifying the dominance of the higher sector vis-a-vis the primary. The Bolshevik Revolution of 1917, on the other hand, unleashed a series of changes which reversed the previous dominance of both the university within the higher education sector and higher education as a whole, while reasserting if not intensifying the role of central government.

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6. Serbia—78.9%; Portugal—73.4%; Russia—70%. See Paul Monroe, ed., *A Cyclopedia of Education* (New York, 1911-12), 3: 383.
7. One way of measuring this contrast is by calculating the ratio of the number of higher educational students to the number of primary pupils. See Michael Kaser, "Education and Economic Progress: Experience in Industrialized Market Economies," in E. A. G. Robinson and J. Vaizey, eds., *The Economics of Education* (London, 1966), 89–173; and Michael Kaser, "Education in Tsarist and Soviet Development," in C. Abramsky, ed., *Essays in Honour of E. H. Carr* (London, 1974), 229–54. For an analysis of the resulting figures as they apply to Tsarist Russia, see James C. McClelland, *Autocrats and Academics: Education, Culture, and Society in Tsarist Russia* (Chicago, 1979), 49–53.

The most noteworthy changes of the years between 1900 and 1914 can be summed up in the words growth and diversity: a dramatic increase in enrollments at all schools and the establishment of a host of new types of educational institutions. The major causes of these changes were the emergence of a professional middle class having the strength and determination to press for educational changes, the temporary weakening of the autocracy's ability to resist public pressures as a result of the Revolution of 1905 and the bold vision of the Ministry of Finance in founding new schools tailored to meet the needs of an industrializing economy.

Liberal public opinion had been a persistent critic of tsarist educational practices throughout the second half of the 19th century. One of the goals of this movement was the establishment of higher educational facilities for women, who were prohibited from matriculating at the universities. A number of higher courses for women, most having university-type curricula but without the right of universities to confer special privileges on their graduates, were established in the 1870s.[8] Despite considerable public support, bureaucratic mistrust led to the closing of all the courses but one in the late 1880s. Official restraints were eased shortly before the turn of the century, however, and the next 15 years witnessed a tremendous boom in the establishment and growth of higher courses for women. By 1912–13 the two largest courses in Moscow and St. Petersburg enrolled 6,477 and 5,897 respectively,[9] and in 1914–15 the total enrollments in all higher courses was a staggering 33,489.[10] This number was almost as large as that of students at the men's universities and constituted 30.5% of all higher educational students in Russia. In Germany at this time women represented a mere seven percent of the entire student body, while in France they comprised 10% of all university students.[11] Although Russian women had still not achieved complete educational equality with men, Russia was clearly a European leader in women's higher education on the eve of World War One.

Women students showed an overwhelming preference for the traditional university courses of study—the liberal arts (including the sciences), law and especially medicine. In 1914–15 only 1,629 women, barely five percent of the total, were enrolled in agricultural, technical and commercial courses.[12] One consequence of the massive influx of women into higher education before World War One, therefore, was to reinforce the proportionate weight of university studies among the student body as a whole.

Women's higher courses were not the only educational institutions founded at this time outside the regular state network by individuals or local bodies. Shaniavskii University, funded by a private donor, sponsored by the Moscow City Duma and

8. See Christine Johanson, "Statesmen, Women, and Professors: Autocratic Politics and Women's Higher Education During the Reign of Alexander II, 1855–1881" (Diss. University of California at Santa Barbara, 1979).
9. Nicholas Hans, *History of Russian Educational Policy, 1701–1917* (New York, 1965, first pub. 1931), 241.
10. *Trudy,* 518–19.
11. Ringer, 291–95, 337–38; and K. Jarausch, *Students, Society and Politcs in Imperial Germany* (Princeton, 1982), 109.
12. *Trudy,* 518–19.

regulated by the Ministry of Education, opened its doors in 1908. Featuring an open admissions policy and a curriculum which emphasized the practical applications of subjects in the liberal arts, it achieved an enrollment of over 3,500 by 1912.[13] The psychologist V. M. Bekhterev was the moving force behind the establishment of the Psychoneurological Institute in St. Petersburg (1907) which sought to integrate the study of pedagogy with that of neurophysiology.[14] Strictly pedagogical institutes were established in Moscow and St. Petersburg. Private individuals and public organizations were also active at the secondary level. In particular, they founded a number of boys' gymnasia, most of which closely conformed to the state gymnasia so that their pupils would receive equivalent privileges.

The most innovative educational institutions, however, were established not by the liberal public, but by the Ministry of Finance. The leading figure behind this policy was Count Sergei Witte, who guided Russia's first industrial spurt during his tenure as minister from 1892 to 1903. Vocational education, including several of the venerable technical institutes, had been transferred from the Ministry of Finance to the Ministry of Education in 1881. Unimpressed by the educational policies of the Ministry of Education, Witte (building on the work of his predecessor I. A. Vyshnegradskii) created a new network, which was more flexible and more oriented to the economic needs of the country. Most important at the higher education level was the founding of three polytechnical institutes which stressed economics as well as technical disciplines and helped lay the intellectual groundwork for central economic planning.[15] Witte also established a commercial institute which quickly became the most popular higher educational institution in Moscow.[16] In addition to modern and innovative curricula, Ministry of Finance schools enjoyed freedom from much of the heavy-handed censorship and petty restrictions that afflicted the universities and institutes under the Ministry of Education. Most Russian liberals did not approve of Witte's methods of industrialization, but they flocked, both as students and as teachers, to his educational institutions. St. Petersburg Polytechnical Institute, founded in 1902, boasted an enrollment of 5,215 in 1913, making it the second-largest technical institute in the world.[17]

The universities during most of this period remained hobbled by the restrictions of the 1884 charter. The issue of university reform was fraught with political overtones and as a result the efforts of officials and professors to agree on a new university charter ended in failure. Nonetheless the autocracy in 1905, frightened by the rising tide of revolutionary unrest, temporarily granted considerable autonomy to the universities. Although this concession was in effect withdrawn when the government regained control after the revolution, it nevertheless did lead to increased flexibility

13. A. A. Kizevetter, *Na rubezhe dvukh stoletii* (vospominaniia, 1881–1914) (Prague, 1929), 471–95.
14. Alexander Vucinich, *Science in Russian Culture, 1861–1917* (Stanford, 1970), 322.
15. *S-Peterburgskii Politekhnicheskii Institut Imperatora Petra Velikogo, 1902–1952,* 2 vols. (Paris-New York, 1952–58); Gregory Guroff, "The Legacy of Pre-Revolutionary Economic Education: St. Petersburg Polytechnic Institute," *Russian Review* (July, 1972), 272–85.
16. Kizevetter, 470.
17. *Minerva: Jahrbuch der Gelehrten Welt,* 23 (1914), 1593. Belfast Municipal Technical Institute was first with an enrollment of 6,550.

within the university sector. Faculties were authorized to allow their students to take some of their courses on an elective basis. Academic specialties not envisioned in the 1884 charter could be added to the curriculum by hiring privatdocents to teach them on an *ad hoc* basis. Greater use was made of laboratories and seminars as instructional tools as well as for research. The physics laboratories of P. N. Lebedev at Moscow University and D. S. Rozhdestvenskii at St. Petersburg University evolved into specialized collective enterprises in which several researchers collaborated in their work on closely related topics.[18] Many scientists were, in addition, trying to obtain funds for the establishment of specialized research institutes that would be independent of both the universities and the Academy of Sciences. This movement received added impetus after 1911 when Lebedev and many other eminent scientists resigned from Moscow University to protest the actions of Education Minister L. A. Kasso.[19] Between the years 1905 and 1908 admission restrictions were eased for women, Jews and graduates of realschulen and seminaries, and, as a result, university enrollments increased sharply until 1909, when restrictions began to be reimposed[20] (See Alston Table 4). Nonetheless, Moscow University's enrollment of 9,760 in 1913 ranked it as the third-largest university in the world.[21] On the eve of the war, Russian universities, while restricted by an out-of-date legal structure, were nonetheless exhibiting many of the characteristics of modern universities elsewhere—in particular a rapid expansion of enrollment and large-scale collaborative research efforts.

What impact did the developments during the 1900–1914 period have on the three major characteristics of Russian higher education described earlier? First is the question of the pre-eminence of the university and traditional courses of study within the higher educational network as a whole. Rampant student activism and the important role of higher educational institutions in the Revolution of 1905 had helped to sour the attitudes of conservatives toward higher education in general and universities in particular. The decision in 1907 to found a new university (consisting at first only of a medical faculty) at Saratov was opposed by a strong minority in the Council of Ministers. The government rarely spoke with one voice on educational matters, but important figures, including the Tsar himself, were beginning to express a preference for specialized institutes over universities.[22]

Such an attitude was not shared by most elements within the liberal public. The Octobrists, a liberal party, argued for a policy of university expansion in the State

18. M. S. Bastrakova, *Stanovlenie sovetskoi sistemy organizatsii nauki (1917-1922)* (Moscow, 1973), 40; D. I. Bagalei, "Ekonomicheskoe polozhenie russkikh universitetov," *Vestnik Evropy* (January, 1914), 222–27; Vucinich, *Science in Russian Culture, 1861–1917,* 201–04.
19. K. A. Timiriazev, *Nauka i demokratiia: Sbornik statei, 1904–1919 gg.* (Moscow, 1963), 56–66, 424–52; Loren R. Graham, "The Formation of Soviet Research Institutes: A Combination of Revolutionary Innovation and International Borrowing," in *Economic Development in the Soviet Union and Eastern Europe,* ed. Zbigniew M. Fallenbuchl (New York, 1975), 1:135–40; Bastrakova, 29–42.
20. Bagalei, 222–24; Samuel D. Kassow, "The Russian University in Crisis: 1899–1911" (Diss. Princeton University, 1976), 473–74, 501–02, 556–59.
21. *Minerva,* 23:1593. By 1916 Moscow University's enrollment had grown to 11,184. Hans, *History of Russian Educational Policy,* 238.
22. Kassow, 598–619.

Duma.[23] It has already been noted that the overwhelming majority of the popular higher courses for women offered programs of study identical to those of the universities. Important spokesmen for the liberal professoriate, while welcoming the variety of new types of educational institutions that were emerging, nonetheless reaffirmed that the research university must preside at the top of the educational edifice.[24]

A look at enrollement trends between 1900 and 1912, on the other hand, reveals a decline in the proportion of students undertaking university-type programs. Enrollments at the state universities, while doubling in absolute numbers, declined from 51% to 32% of total higher education enrollments (See Table 1). These figures are misleadingly low, however, for many other institutions were offering programs similar or identical to those of the universities. It is more meaningful to group all such programs together, regardless of the precise nature of the institutions offering them. The group of institutions offering courses of study in the liberal arts and traditional professions of law and medicine includes all state universities, almost all women's higher courses, and some of the non-university institutions for men (the lyceums, the Historical-Philological Institute, and the Military Medical Academy are examples). The other group is composed of schools offering courses of study that are technical, practically oriented or innovative, and therefore includes not only technical and agricultural institutes but also new institutions such as Shaniavskii University and the Psychoneurological Institute. University-type enrollments, when grouped on this basis, also show a decline relative to technical-practical enrollments but not nearly as precipitous a one as that of the state universities alone. The decline is from 80% in the late 19th century to 74% at the turn of the century to 64% for 1912/13. The corresponding figures for Germany are remarkably similar until the period after 1900, when German universities recouped their previous position instead of continuing to decline (See Table 2).

Another way of analyzing the Russian data is to compare rates of growth between 1900 and 1912 for the different kinds of institutions and courses of study. All higher education enrollments increased by a factor of 3.3 during this period. Among the fastest-growing institutions were the women's higher courses, enrollments of which increased by more than five times between 1905 and 1912. (A comparison of enrollments between 1900 and 1914 would show an even higher growth rate.) In terms of courses of study, technical-practical institutions considered as a whole grew at a rate of 4.6 compared to 2.8 for the liberal arts and the professions. New institutions, such as the polytechnical institutes and Shaniavskii University, accounted for most of the enrollment growth in technical-practical courses of study. The older technological institutes experienced a growth rate of only 2.1, identical with that of the state universities and well below the average growth rate of all higher educational institutions (See Table 1).

What were the causes of this pattern of enrollment growth among the various types of higher educational institutions? Does it demonstrate that the newer institutions

23. Kassow, 561-62.

24. Kizevetter, 484; V. I. Vernadskii, "Vysshaia shkola v Rossii," *Ezhegodnik gazety Rech' na 1914 god* (Saint Petersburg, 1914), 310-11; N. V. Speranskii, *Krizis russkoi shkoly: Torzhestvo politicheskoi reaktsii: Krushenie universitetov* (Moscow, 1914), 1-12.

Table 1: Comparison of Enrollment Growth in Various Types of Higher Educational Institutions in Russia from ca. 1900 to 1912/13

	Enrollments (in thousands) 1899	1900	1905	% of total	Enrollments (in thousands) 1912/13	% of total	Rate of increase ca. 1900-1912/13
State Universities		15.6		51%	32.1	32%	2.1
Other Higher Educational Institutions for Men							
Total	9.6			32%	39.0	39%	4.1
Lib. Arts/Prof.	1.7				3.7		2.2
Tech./Prac.	7.9				35.3		4.5
Women's Higher Courses							
Total			5.2	17%	28.3	28%	5.4
Lib. Arts/Prof.			5.2		27.3		5.3
Tech./Prac.			0		.9		
Total Higher Education		30.4		100%	99.4	100%	3.3
Total Lib. Arts/Prof.		22.5		74%	63.1	64%	2.8
Total Tech./Prac.		7.9		26%	36.2	36%	4.6

Note: Poland and Finland not included.
Totals do not always tally due to rounding.

Sources: For universities, Rashin, "Gramotnost' i narodnoe obrazovanie, 77". For Warsaw University 1900/01, S. E. Belozerov, Ocherki istorii Rostovskogo universiteta (Rostov, 1959), 151. For Warsaw University 1912/13, Minerva: Jahrbuch der Gelehrten Welt, 23 (1914), 1484. For all other data, Nicholas Hans, History of Russian Educational Policy, 1701-1917 (New York, 1964, first pub. 1931), 239-41.

were more responsive either to the needs of the country or the preferences of the public than the more traditional schools? Such a conclusion would not be entirely warranted. Most women would have preferred to attend the universities, and in any event were undertaking university-type studies. Of the students in the schools of the Ministry of Finance, many were undoubtedly more attracted by their relatively free atmosphere than by the technical or practical nature of their curricula. Finally, we must remember that there was not really a free choice in Russia for most potential students. The demand for any kind of higher education in this period well exceeded the supply of available places. Students matriculated at institutions where they were

Table 2: Comparison of Percentage of Higher Education Students Enrolled in University-Type Programs in Russia and Germany for Selected Years, 1860–1931

Russia		Germany*	
1860-1900**	80%	1890	81%
		1895	74%
ca. 1900	74%	1900	71%
		1905	72%
1912/13	64%	1911	80%
1920/21	76%	1921	73%
1927/28	54%	1926	69%
1930/31	27%	1931	77%

*Unlike Ringer, I have considered German technical institutes and academies as part of the higher education sector for the entire period covered by this table.

**This figure represents the total number of graduates during the period in question. All other figures represent students enrolled in that year.

Sources: For Russia, 1860-1900, computed from data in V. R. Leikina-Svirskaia, Intelligentsiia v Rossii vo vtoroi polovine XIX veka (Moscow, 1971), 69-70. For Russia, ca. 1900 and 1912/13, Table 1. For Russia, 1920/21, computed from data in Trudy Tsentral'nogo Statisticheskogo Upravleniia, 35 vols. (Moscow, 1920-28), Vol. 12, Pt. 1 (1922), ix. For Russia, 1927/28 and 1930/31, computed from data in Narodnoe khoziaistvo SSSR: Statisticheskii spravochnik 1932 (Moscow-Leningrad, 1932), 512-13, cited hereafter as Narodnoe khoziaistvo 1932. For Germany, computed from data in Fritz K. Ringer, Education and Society in Modern Europe (Bloomington and London, 1979), 291-92.

accepted and for which their secondary education had prepared them—not necessarily where their first choice would have taken them. The pattern of institutional diversification in late Tsarist Russia was the result neither of a comprehensive plan on the

part of the government nor of conscious choice on the part of the public, but rather of a series of uncoordinated, *ad hoc* and sometimes mutually inconsistent actions of various groups within both government and public.

A similarly mixed response must be given to the question of whether state control over education was diminished in the decade and a half before World War One. On the one hand, it is indisputable that the increased activity of private and public organizations helped to produce a much more flexible and differentiated educational network, despite the fact that these actions had to be approved and were frequently hampered by the central government. Yet Ministers of Education A. N. Schwartz and L. A. Kasso made a valiant effort between 1908 and 1914 to stem the tide of public initiative and to reassert bureaucratic control over the increasingly complex educational institutions under their jurisdiction. They did not completely achieve their goal but came close enough to cause intense despair among educators and the liberal public.

Regarding the third characteristic, however, the conclusion can be clear and unambiguous. The great disparity between the higher and primary educational sectors not only did not diminish, but actually increased during this time. This fact may surprise those who are aware that the Duma helped initiate in 1908 a program for the gradual introduction of compulsory primary education, that the Ministry of Education's budget nearly quadrupled between 1902 and 1913 and that the ministry began to allocate a much larger share of this budget to the primary sector. Despite these actions, however, the higher and even the secondary sectors continued to grow at a faster rate than the primary. Table 3 shows that enrollments in all schools, when adjusted for population growth, increased at a rate of 1.6 during the years 1900–1914. The rate of increase of secondary school enrollments was slightly higher (1.8), whereas that of higher educational institutions was more than twice as high (3.8). International comparisons highlight the picture further. The Russian rate of illiteracy declined from 70% in 1897 to 61–62% in 1913[25]—a rate that was still almost immeasurably behind that of the other powers. In terms of higher education enrollments as a function of population, on the other hand, Russia was increasing so rapidly on the eve of the war that she was beginning to approach the levels attained by Germany and France (See Alston Table 12).

Soviet Policies:

Such was the educational heritage of Tsarist Russia—a strange combination of impressive strengths and appalling weaknesses. How did the Bolsheviks approach the task of reforming and expanding the educational system they inherited? If one overlooks the early years of 1917 to 1921, which witnessed wide fluctuations in educational policy, one finds that during the 1920s and 1930s the Bolsheviks reasserted the tsarist practice of strong central governmental control over educational institutions. This fact does not mean that Soviet educational policy was, any more than tsarist policy had been, the result of the implementation in practice of a preconceived blue-

25. A. Rashin, "Gramotnost' i narodnoe obrazovanie v Rossii v XIX i nachale XX v," *Istoricheskie zapiski*, 37 (1951), 28–50.

print for reform. The Commissariat of Education (*Narkompros*) was not more successful in its efforts to gain jurisdiction over all educational institutions than its tsarist predecessor had been. Educational policies continued to be the outcome of clashes among interest groups in the central arena of government (plus, in the Soviet case, the party). Nonetheless, a distinctively Soviet pattern of reforms in the inherited educational structure can be detected. These reforms were implemented gradually but unmistakably during the NEP years of 1921 to 1928 before being pushed to extremes in the crisis atmosphere of the first Five-Year Plan (1928–1932).

Two very clear trends emerge. The first is a downgrading of the importance of universities and of the more theoretical and non-utilitarian types of education. Aside from a brief resurgence in university enrollments during the years immediately following the Revolution (which may indicate a public preference at that time for universities over other types of higher education), enrollments in universities and university-type programs continued their relative decline which had begun before the Revolution. Their share of all higher education dropped from 74% around the year 1900 to 64% in 1912/13 and 54% in 1927/28 (See Table 2). In fact, however, the decline in traditional university studies between 1921 and 1927 was much sharper than these percentage figures indicate and much more extensive than the decline during the last decade and a half of tsardom. Many of the new universities founded after the Revolution contained technical faculties, and, as a result, some of the university students were engaged in technical courses of study rather than in the more traditional university curricula.[26] Furthermore, the traditional faculties in most universities were themselves reformed in an effort to make the curricula more vocationally oriented and more in accordance with the doctrines of Marxism. All law faculties were abolished in December 1918 and, together with the historical departments of the historical-philological faculties, were reconstituted as social science faculties which were in turn replaced a few years later by a number of more specialized faculties such as Soviet law and economics. All but four of the faculties of mathematics and physics were replaced by pedagogical faculties designed to produce teachers of science rather than scientific researchers.[27]

This policy was carried to its ultimate extreme in 1930–31, when universities themselves were abolished as corporate entities. Most of the faculties of the former universities were reconstituted as separate institutes, and their curricula were revamped in a still more narrow, utilitarian direction. Simultaneously, there was a tremendous expansion in higher technical education.[28] As a result, the percentage of higher educational students studying (in medical, pedagogical and fine arts institutes) traditional universitiy or liberal arts subjects dropped to a record low of 27 percent. This trend marked a very sharp divergence with the practice in Germany, where during

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26. *Narodnoe prosveshchenie: Ezhemesiachnyi sotsialisticheskii organ obshchestvenno-politicheskii, pedagogicheskii i nauchnyi,* No. 18–20 (Moscow, Jan.-March, 1920), 88; *Vysshaia shkola v RSFSR i novoe studenchestvo (Al'bom)* (Moscow, 1923), appendix, 24–25.
27. *Sbornik dekretov i postanovlenii rabochego i krest'ianskogo pravitel'stva po narodnomu obrazovaniiu* 2 (Moscow, 1920), 15–16; Sh. Kh. Chanbarisov, *Formirovanie sovetskoi universitetskoi sistemy (1917–1938 gg.)* (Ufa, 1973), 168–73, 273–78.
28. *Narodnoe khoziaistvo SSSR: Statisticheskii spravochnik 1932* (Moscow-Leningrad, 1932), 512–13; Chanbarisov, 281–85.

Table 3: Comparison of Rates of Increase of Enrollment-to-Population Ratios for Different Educational Sectors in the Russian Empire, 1900–1914

	1900	1914	Rate of Increase
Population (in millions)	133.0	175.1	1.3
Students in all Schools (in thousands)	4,500	9,500	2.1
Students per 10,000 pop.			
All Schools	338	542	1.6
Secondary Schools	19.7	36.0	1.8
Higher Educational Institutions	2.0	7.5	3.8

Note: Includes Poland but not Finland.

Source: Adapted from Hans, History of Russian Educational Policy, 242.

the years between 1921 and 1931 the percentage of students enrolled in university-type programs ranged from 69% to 77% (See Table 2). By the mid-1930s universities had been restored in Soviet Russia as part of a more general pattern of conservative social policies that followed in the wake of the Cultural Revolution of 1928 to 1931 (See Table 4).[29]

The second major trend of the 1920s and early 1930s was a growth rate in primary-secondary enrollments, and, especially in primary-secondary vocational school enrollments, that was considerably faster than the growth rate of the higher educational sector. This trend marked a sharp reversal of the priority that had been given to higher education throughout the entire Tsarist period. Between 1914/15 and 1927/28 enrollments in primary and secondary schools of general education grew by a rate of 1.3, enrollments in primary-secondary vocational schools by a rate of 2.2, while higher education enrollments grew by a factor of only 1.2. This trend was accelerated during the first Five-Year Plan. In the short three-year period of 1927/28 to 1930/31 primary-secondary vocational enrollments increased by a factor of 2.6 (from 628,700 to 1,749,600), whereas higher education enrollments grew at the considerably slower (but still impressive) rate of 1.6 (See Table 5).[30]

29. For this entire period see the essays in Sheila Fitzpatrick, ed., *Cultural Revolution in Russia, 1928–1931* (Blomington and London, 1978).
30. For the especially rapid growth of secondary vocational enrollments compared to higher education enrollments, see *Kul'turnoe stroitel'stvo SSSR: Statisticheskii sbornik* (Moscow-Leningrad, 1940), 102.

Table 4: Enrollments in Various Types of Higher Educational Institutions in Soviet Russia for 1920/21, 1927/28, and 1930/31
(In Thousands)

Type	1920/21	1927/28	1930/31
Universities	83.8	53.0	0
Medical Institutes	6.4	10.0	26.8
Pedagogical Insts.	16.0	15.9	41.4
Art-Music Insts.	14.6	6.9	4.7
Total Lib. Arts/ Professions	120.8	85.8	72.9
Tech.-Ind. Insts.	22.7	45.6	140.5
Agricultural Insts.	8.9	22.4	36.0
Social-Econ. Insts.	5.7	6.0	22.8
Total Tech.-Pract.	37.3	74.0	199.3
Total	158.2	159.8	272.2

Note: 1920/21 figures represent the number of students registered, which was larger than the number who were actually pursuing their studies. On the other hand, the 1920/21 figures represent an under-count insofar as data are available only for 210 out of the 246 higher-educational institutions in existence at that time. I suspect that these biases do not evenly cancel themselves out, but that a bias in the direction of inflation remains. We can assume, however, that the data reliably reflect the enrollment ratios among different types of institutions.

Sources: 1920/21, 1927/8 and 1930/31 see note to Table 2.

What can we conclude from this survey of a 70-year period in the history of Russian-Soviet education? Centralized administrative control over the educational system is a constant factor throughout the entire period. But the ends which this central-

Table 5: Comparison of Rates of Increase of Enrollment-to-Population Ratios for Different Educational Sectors in Soviet Russia, 1914/15-1930/31

	1914/15	1927/28	1930/31	RI, 1914/15-1927/28	RI, 1927/28-1930/31	RI, 1914/15-1930/31
Population (in millions)	139.3	150.6	160.6	1.1	1.1	1.2
Students in all Schools (in thousands)	8,192.3	12,144.7	19,791.9	1.5	1.6	2.4
Students per 10,000 pop.						
All Schools	588	806	1,232	1.4	1.5	2.1
Prim.-Sec. General Ed. Schools	560	754	1,106	1.3	1.5	2.0
Prim.-Sec. Vocational Schools	19	42	109	2.2	2.6	5.7
Total Prim.-Sec. Schools	579	796	1,215	1.4	1.5	2.1
Higher Educational Insts.	9.0	10.6	16.9	1.2	1.6	1.9

Note: Territorial unit for 1914/15 data is pre-1939 borders of USSR. This fact explains the discrepancies with Table 3, where territorial unit is the Russian Empire. Population figure in 1914/15 column is actually for 1913/14. RI represents rate of increase. Higher education enrollments do not include workers' faculties or communist party educational institutions.

Sources: Population, 1914/15: Sotsialisticheskoe stroitel'stvo SSSR: Statisticheskii ezhegodnik, Vol. 3 (Moscow, 1936), 542, which gives the date January 1, 1914. The same figure is given by Eason (citing Vestnik statistiki, 1963, No. 11, 92-95) in Walter W. Eason,

"Demography," in Ellen Mickiewicz, Handbook of Soviet Social Science Data (New York and London, 1973), 51 and 61, which gives the date as "average for year" of 1913. Narodnoe khoziaistvo 1932, XXII and 401, gives a slightly lower figure of 138.2 for January 1, 1914, but this figure appears to be no longer in use by Soviet statisticians.

Population, 1920/21: Narodnoe khoziaistvo 1932, XXII and 401.

Population 1927/28: Ibid., XXIII. Eason (51) gives the figure 150.5.

Population, 1930/31: Narodnoe khoziaistvo 1932, XXIII, and Eason, 51.

Enrollment figures: Narodnoe khoziaistvo 1932, XXII-XXIII and 507.

Enrollment-to-population ratios: Calculated from data in Ibid.

ized control was used to achieve and the ways in which it interacted with social and economic pressures were sharply different in the Tsarist and early Soviet periods. In the latter half of the 19th century the university-dominated educational structure reflected a probably exaggerated belief in the importance to a developing country of pure research, a failure to grasp the economic importance of widespread literacy and technical skills and a probably realistic fear of the political dangers of mass education. By 1930 the highly vocationalized university-less educational system reflected a now exaggerated *dis*belief in the value of theoretical studies, a zealous effort to expand technical education at all levels and a probably correct assumption that the spread of mass education would enhance popular loyalty to the new government. In the 19th century the Russian educational system was unique among Western nations for the stress placed on universities relative to other higher, secondary and primary educational institutions. In 1930 the Soviet educational system was unique because of its abolition of universities and near-total emphasis on vocational and utilitarian schooling. Concerning the crucial issue of the proper role of universities in the overall educational system, therefore, Russian-Soviet education had during the course of 70 years run the entire gamut from one extreme to its polar opposite.

Jurgen Herbst

Diversification in American Higher Education

In the United States the diversification of higher education antedates the period under discussion in this book by at least half a century. American higher education parted with the tradition of continental Europe's universities as provincial or national institutions under public direction before the beginning of the 19th century. Neither could one assume thereafter that only scholars or public authorities were the founders of universities nor could one expect local rulers or representative government to provide and supervise university administration. Most crucial for a discussion of diversification, one could no longer take it for granted that the purpose and the reason for the creation of an institution of higher education was necessarily wholly or in part related to *raison d'état* or the national or provincial welfare. Instead, institutions of higher education began to owe their existence to the activities of many diverse groups. Some were church bodies which acted not as ecclesiastic arms of the provincial or national establishment, but as private organizations. At times they viewed themselves as self-appointed stewards of the public weal; at others they pursued a policy of purely denominational or sectarian evangelism. Other bodies were promotional organizations like land and settlement companies or chambers of commerce; others yet were business or professional associations whose members cherished colleges or universities as potential economic assets and cultural as well as social attractions for their neighborhood. Religious, business, and professional considerations, primarily local in their immediate import, complemented the traditional public concerns that had led in the colonial period to the establishment of provincial colleges and, after the Revolution, to the creation of the first state universities.

Pre-Civil War Decentralization:

Diversification in the United States was linked to the appearance of private institutions and represented, in its first stages, an attack on the higher education monopoly held by the 18th century provincial colleges. If one is to grasp its full meaning, he must first consider the social, political, and intellectual ramifications of higher education as a public monopoly. In the colonies the colleges were the training grounds of a governing and professional elite precisely because their curriculum was undiffer-

entiated and corresponded, in a rough measure, to the instruction given in the arts faculties of continental European universities and in the colleges of Oxford and Cambridge. While it was often emphasized that the colleges were to train ministers, this training was thought to be equally appropriate for lawyers, politicians, statesmen, physicians, businessmen and masters of the Latin grammar schools. The future men of affairs in every professional walk of life were educated together. Unless they had attended the college of a neighboring colony, they had been trained in *the one* institution of their province. There they had formed life-long friendships and imbibed a sense of loyalty and obligation towards their commonwealth. Higher education as a public monopoly had instilled into a society's elite a common devotion to public service in the spirit of *noblesse oblige.*[1]

Diversification was to change all this. Going to college in the first half of the nineteenth century would not necessarily provide entry to the ruling elite; would not necessarily acquaint the student with the *one* education—the *artes liberales*—that certified him as a member of a provincial governing class; would not necessarily train him, as Benjamin Franklin expected his Philadelphia academy would do, to enter *any* profession, and would not always give him public status as an "educated man." Diversification divided and privatized the educated. It destroyed the concept of the "man of affairs" as public leader and replaced it with an expectation of a widespread literacy and business competency among the many. Alexis de Tocqueville observed in the 1830's that "a middling standard is fixed in America for human knowledge," and that this had led him to believe that there was no other country in the world "where, in proportion to the population, there are so few ignorant and at the same time so few learned individuals."[2] It is, of course, not my intent here to argue that diversification of higher education caused the privatization and decline of an educated elite. This is a contention for which evidence would be hard to find, indeed. But the point is that in the United States diversification of higher education in its early stages reflected the decentralization of society and economy and favored private over public initiative and responsibility.

Diversification, decentralization, and privatization led to a decline in the social and academic prestige of the new institutions founded around and after the turn of the century. These schools were less expensive to attend as they first developed in the interior, away from the larger urban centers of trade and commerce. In a period of agricultural depression, particularly in New England, they were eager to attract boys from farming areas and families of orthodox and pious religious leanings.[3] Their own poverty together with their frequently evangelistic sense of mission prompted them to enroll as many students as they could, without insisting too closely on past scholastic achievement or future promise. Their students lacked the more sophisticated backgrounds of their contemporaries from old established families in social and cultural centers, and they had been prepared for college in most cases through

1. I have discussed these developments at greater length in my *From Crisis to Crisis: American College Government 1636–1819* (Cambridge, Ma., 1982), part III.
2. Alexis de Tocqueville, *Democracy in America*, ed. by Phillips Bradley (New York, 1945), 1:54, 55.
3. On this see David F. Allmendinger, Jr., *Paupers and Scholars: The Transformation of Student Life in Nineteenth-Century New England* (New York, 1975), 12–15.

the Latin instruction of their local minister. Their financial means were limited, in many instances they worked during their college years to defray expenses, and their families paid college fees in produce. The relative absence of Latin grammar schools to prepare students for college and the limited resources of a private college inevitably forced the instructors to spend a good deal of their time in college-preparatory work. Many of the students were enrolled in the grammar school class, rather than in the college proper, and many attended college for one or several years without ever reaching the senior year or graduating with a bachelor's degree. Therefore diversification meant some lowering of academic standards—the "great retrogression" of which Richard Hofstadter once wrote[4]—and made it subsequently impossible to differentiate sharply between institutions of secondary-preparatory education and institutions of higher education.

We can understand and appreciate the meaning of diversification in American higher education during the first half of the 19th century only when we realize the close relationship between and even the identity of preparatory and collegiate institutions. Diversification originated in the institutions of preparatory education, not as a matter of governmental, administrative, or educational policy, but as response to competitive supply and demand on a large number of regionally diverse educational marketplaces. Settlers in the hinterland and on the frontier wanted educational opportunities for their sons and eventually for their daughters as well. They wished to raise up among themselves an educated leadership of their own: Lawyers and physicians, surveyors and accountants, engineers, and schoolmasters and schoolmistresses. As they welcomed among themselves the graduates of Princeton and Yale and other educational missionaries from the East, they expected these men to help them set up schools and colleges of their own and to bequeath to them the educational heritage of the civilized world. Eventually they would want to strike out into agricultural and industrial education as well. Though the sounds of classical learning echoed through the halls of the new institutions, the marks and interests of a new country and a new society were also plainly in evidence.

They gave to these institutions a wide range of purposes and names, and blurred the lines of distinction between secondary and collegiate education. If we look at Illinois for an example we find that before 1855 public elementary schools as we know them today did not exist in the state.[5] Apart from the efforts of a few localities and of private schoolmasters who were concerned with common schools, the educational effort that existed was devoted in a rather undifferentiated manner towards preparatory and collegiate education. Institutions were chartered whose purpose was "the diffusion of knowledge," "the promotion of the general interests of education," and the qualification of "young men to engage in the several employments and professions of society ... to discharge honorably and usefully the various duties of life." Their trustees were pledged to expend donations they had accepted "in conformity with the express conditions of the donor"—what ever they might be. As a result the

4. Richard Hofstadter, *Academic Freedom in the Age of the College* (New York, 1961), 209–222.

5. Henry C. Johnson, Jr. and Erwin V. Johanningmeier, *Teachers for the Prairie: The University of Illinois and the Schools, 1868–1945* (Urbana, 1972), 12.

character of much of the educational work in the state remained on the level of preparatory secondary schooling, even though many of the chartered institutions had been given the right to grant academic degrees.[6]

What diversification actually meant may become clearer when one looks at the types and names of institutions founded in Illinois before 1855. There we find female high schools and teacher seminaries; literary and theological institutions; female academies; liberal institutes for the establishment and support of education; seminaries of learning for the advancement of religion, science, and "the cause of education generally;" at least one seminary for the promotion of "English and German literature;" one commercial and mathematical institute to teach "double-entry bookkeeping and the laws of trade, of commercial calculations and the higher mathematics;" manual labor colleges, schools, seminaries, and universities; medical and literary colleges and universities as well as agricultural and female colleges and universities. In many instances, to be sure, these differences in designations amounted to no more than words. One may be reasonably sure that what went on in the classrooms did not differ much from school to school. What a teacher did or could do, after all, was largely prescribed by the state of prior education—or lack of it—of his students. But in comparison with the quite uniform and universally recognized character of an 18th century college curriculum, the differences introduced into American collegiate education in the first half of the 19th century were novel and momentous.

Evidently the diversification taking place in the first half of the 19th century represents an entrepreneurial response to demands from certain segments of the population. Parents were fearful that their children might succumb to the often decried "barbarism" of the frontier. If they were worried for their sons, they were even more concerned for their daughters. Colleges could "take care" of sons by preparing them for a better and socially more distinguished career than the parents had enjoyed. They would shelter daughters and, should there be need to bridge the waiting period until marriage or, even worse, to face the prospect of life as a spinster, they would get them ready for useful employment as schoolteachers. There were demands, too, for new professional career training in industry, technology, agriculture, business—all activities needed in the exploitation of the continent. Illinois does not exhaust the responses. In New York, for example, a technical college was opened with the Rensselaer Polytechnical Institute at Troy. Professional schools in medicine, law, and divinity were common in many states. After 1865 colleges for black students began to grant baccalaureate degrees in the North and to open their doors in the South. Much, though not all, of this educational upheaval competed with traditional preparatory and collegiate institutions and, in its spontaneity, appeared without benefit of or hindrance by governmental planning or public supervision. Diversification was a manifestation of educational laissez-faire.

Though the overwhelming numbers of new foundations were of private origin, public institutions were not entirely absent. The U.S. Military Academy at West Point, New York, was a federal institution, and state universities were created in Georgia, North Carolina, Vermont, Ohio, South Carolina, Virginia, Alabama, India-

6. The quoted passages in this paragraph and the next as well as the various designations of academic institutions have been taken from Illinois State Statutes of the period.

na, Michigan, Missouri, Mississippi, Iowa, Wisconsin, and Minnesota. Advocates of new directions for higher education in teacher preparation, agriculture, and industry succeeded in mobilizing popular demand for federal aid to higher education and, with some help from the novel and pressing circumstances created by the Civil War, pressured Congress to pass the Morrill Land Grant Act in 1862. Its intent was to encourage colleges "to teach such branches of learning as are related to agriculture and the mechanic arts ... without excluding other scientific and classical studies, and including military tactics ... in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."[7] With the passage of that act diversification passed its early stages of spontaneous, even haphazard growth, and was recognized as a key ingredient of national educational policy. As such it had come to encompass at least three distinct purposes: 1) To satisfy the desire for educational opportunities for a socially, ethnically, and religiously diverse population; 2) to provide trained and skilled experts for many different areas of the national economy; and 3) to aid professional establishments in enforcing standards of performance by supervising entrance into the profession and by setting up and maintaining professional qualifications. In the next one hundred years, from the end of the Civil War to beyond the middle of the twentieth century, diversification among and within private and public institutions became the chief device by which American higher education maintained and enlarged the key role it began to play in the country's expanding economy.

Post-Civil War Differentiation:

After the Civil War diversification did not involve, as has sometimes been implied, a replacement of traditional liberal arts colleges with state universities or professional and vocational schools of various types. Instead, diversification added to the already existing variety of institutions. It surrounded liberal arts colleges with technical, mechanical, agricultural and other schools and thus supplemented rather than took the place of the traditional curriculum. Slowly but steadily diversification also raised the level of academic instruction until, towards the end of the century and thereafter, some professional schools (primarily law and medical schools) began to require a bachelor's degree as prerequisite for entry. The emerging pattern of the drawing-in of occupational and professional training into the universities was twofold: Some fields, such as teaching and commercial training, moved up from the academy or institute level of secondary education into collegiate degree programs. Normal schools became teachers colleges. Others like engineering and medicine brought on-the-job training of construction site and hospital into the classroom. As the liberal arts curriculum of the colleges was extended into the Graduate Schools of Arts and Sciences, it experienced a transformation towards professional instruction for teachers and writers, scholars and critics, civil servants and diplomats. We may therefore say that diversification before the Civil War had prepared a wide platform of institutional types on which with the onset of largescale industrial development a new configura-

7. For the Morrill Act see Edward Danforth Eddy, Jr., *Colleges for Our Land and Time: The Land-Grant Idea in American Education* (New York, 1956).

tion of academically and technically more advanced institutions could be placed and developed without making superfluous or destroying the older institutions.

Cornell University in Ithaca, New York, may serve as an example of post-war diversification where a traditional liberal arts curriculum was surrounded with many specialized studies on both the undergraduate and graduate levels. To this day the university's seal carries the words of the university's founder, Ezra Cornell, "I would found an institution where any person can find instruction in any study."[8] At Ithaca and in many state universities the democratic impulse to provide opportunities for a broadly-based, diverse, and ever growing electorate spurred on the tendency towards diversification. The answer to the charge that colleges and universities were privileged sanctuaries for an elite came in the form of diversified institutional and curricular offerings. It was a response to student interest and social demand. A century later this departure from the curricular uniformity and socially limited "old-time college" pattern of higher education came to be derided as drift towards "academic supermarkets." But critics of the 1960s forgot or chose to ignore that founders like Ezra Cornell and university presidents like Andrew White had joined their democratic openness towards new students with their eagerness to accept new fields of study while insisting strenuously and successfully that intellectual discipline and scholarly excellence prevail among all students, no matter what their origin and their choice of field.

However "democratic" and responsive to popular demand diversification may have been at the large universities, it was distinct from its earlier occurrence at antebellum campuses where it had flourished on the preparatory and secondary level. The large university centers after the war diversified through calls for advanced scholarship, research, and professional training. These, it was argued, were needed to stimulate national economic development, not just to satisfy individual ambition. Considerations of a purely academic nature—that no discipline could grow in isolation, and that each needed new knowledge and insights from sister disciplines—were linked with references to the competitive position of American higher education with universities abroad. Pointing to the effect on American scientific, industrial, technical, and agricultural progress, American college graduates complained that the lack of opportunities for advanced training and research in American universities prevented them from developing their talents and serving their country. The interests of an individual career, of the advance of scholarship, and of the national welfare thus came to be blended in the new demand for graduate and professional education. The new universities laid claim not only to leadership in education and research, but in national, industrial, agricultural, and business development as well. Their aim was not learning for learning's sake alone, not research for the sake of pushing back the boundaries of knowledge, but learning and research as university contributions to the nation. Woodrow Wilson, then a professor at Princeton, expressed it well in 1896. "When all is said," he declared, "it is not learning but the spirit of service that will give a college place in the public annals of the nation."[9] In the last analysis, public

8. Morris Bishop, *Early Cornell 1865-1900* (Ithaca, 1962), 74.
9. Woodrow Wilson on "Princeton in the Nation's Service," reprinted in Richard Hofstadter and Wilson Smith, eds., *American Higher Education: A Documentary History* (Chicago, 1961), 2:694.

service was both initial spur and ultimate justification for the diversification of the academic enterprise in the modern age.

The service ideal found its most explicit definition in the Midwest where, in conjunction with the political philosophy of the Progressive Party, it came to full bloom in the "Wisconsin Idea." To serve all the people of Wisconsin through research and teaching was declared to be the function of the state university. Research was to address the state's economic, social, political, and cultural problems, and the university's curriculum was to respond to the needs and desires of the people. As these problems, desires, and needs were diverse, so the university could no longer restrict itself to the transmission of a liberal arts curriculum to its students on the campus. For President Van Hise (1903–1918) the Wisconsin Idea provided the opportunity to distinguish the Madison campus from its many competitors among the private colleges in Milton, Beloit, Appleton, Kenosha, Ripon, and Racine. Already at the middle of the century newspaper editorials had demanded that the university as state institution should be "made accessible to the masses of the youth of the state—the poor as well as the rich," and that "a department of agriculture and mechanics as well as medicine and law" be opened.[10] Such new and distinctive departures, Van Hise knew, carried weight with legislators in the state capitol as they deliberated on appropriations and would answer the question why the campus at Madison should receive public support when such funds would be withheld from the private institutions. But that was not all. Outreach activities had begun with agricultural short-courses and Farmers' Institutes all across the state. Faculty research and consulting, correspondence courses on every level including vocational and elementary school work, popular lectures, county agricultural agents, and faculty participation as advisors to state departments and commissions—all these activities became part of the Wisconsin Idea. The sleepy little Madison campus of mid-century was transformed by the first decades of the twentieth century into an academic center of national and worldwide significance. Diversification of its activities, its curriculum, its teachers and students had accompanied this change.

If service was the announced aim of the new university, research was the motor that made the new departure possible. By 1900 research had come to replace teaching as the university's most characteristic activity. Inquiry or discovery and the dissemination of the new knowledge rather than as in the past the transmission of traditional wisdom and of information came to be seen as a professor's task. The modern university structure of departments and institutes developed in response to demands for trained professionals in science, engineering, medicine, and public administration as well as in consequence of the universities' desire to excel in the traditional academic fields. In the latter the stress on scientific methods of inquiry had begun with textual criticism in Biblical studies, literature, and history. It had led to the opening of graduate seminars and libraries as "laboratories" of the humanities. It continued with the never-ending elaboration of new research methods and new theories in the various academic fields, an elaboration which made specialization and thus diversification the hallmark of the modern university. Research, wrote G. Stanley Hall of Clark Uni-

10. Editorial in *The Southport Telegraph*, February 15, 1850.

versity, became the university professor's religion. It was, Hall said, "the very highest vocation of man."[11]

The rise of service and research inevitably lowered the prestige of teaching and of the undergraduate colleges that continued to cherish teaching as their central concern. This is not to say that research specialists could or would not teach, but it is to say that a shift occurred in the priorities scholars assigned to their varied tasks and in the self-image they cultivated. While within the large universities some professors and departments remained faithful to their teaching, others committed themselves to research and graduate instruction. Among institutions a similar diversification set in. Small undergraduate colleges stressed undergraduate teaching as their mission and advertised the close relationship between faculty members and students to be found in their class and seminar rooms; large research universities delegated much undergraduate teaching to graduate assistants and placed their professors in large lecture halls to speak before hundreds of students. As service and research rather than teaching became the professors' chief occupations their loyalties turned from their college and students to their specialty and their colleagues. As they shaped for themselves a new professional identity as scientific investigators, they came to compare themselves, as one professor once remarked, to army officers who loved their branch of the service but felt little or no attachment to the post on which they served. Institutional identification was temporary; commitment to their field remained permanent.

The new sense of professional identity also highlighted the importance of the profession in the life and work of the scholar. The professional association located the scholar in the world of work. The scholar's peer group consisted not necessarily, not even customarily, of colleagues in college or university, but of colleagues in the profession. The scholar was above all a biologist, or engineer, or historian; he was a professor or a teacher only secondarily. His or her prestige, salary, and place of work was not always determined by colleagues in the university, but by fellow-professionals who might have been employed by private business or government. As a consequence the scholar's decisions often reflected concerns of his professional colleagues about professional qualifications and certification or conditions of the marketplace rather than issues of moment to his college or university. Diversification, specialization, and professionalization thus lead us to doubt whether, towards the end of the nineteenth century, one could any longer speak meaningfully of "academic" issues, whether it was possible to find policy questions in higher education that could be considered in isolation from the organized scientific professions. From the ivory tower to the board or conference room might well describe the modern scholar's professional pilgrimage.

Last, but not least, diversification altered the meaning and effect of college teaching, changed, if you will, the "feel" of the classroom. The "old-time" professor had found his prototypical role like the clergyman-college president in the moral philosophy course, discussing with the graduating seniors any subject under the sun and exploring the lessons the students could draw from it for their ethical conduct as gentle-

11. In G. Stanley Hall, *Life and Confessions of a Psychologist* (New York, 1923), 338.

men-scholars. His successors, professors of the modern social sciences, now would see themselves as expert professionals dispensing information to future specialists and technicians.[12] As Cornell exemplifies the "democratic" university and Wisconsin the service ideal, President Eliot's (1869–1909) Harvard enables one to understand better the meaning of diversification for teaching. Eliot introduced the elective system into the undergraduate college. He believed free elective studies to be more appropriate for students in a democratic society than compulsion under a uniform curriculum. The freedom to choose was in itself an educational experience, forcing the student to take stock of himself. Only with election was it possible, Eliot held, to accommodate the new fields and sciences, and only with such accommodation could Harvard hope to become a great university. The excitement of research and discovery had to pervade the faculty and through them enter into the classroom.[13] Diversification, thus, could not be relegated to laboratory and seminar, but had to be introduced among the undergraduates as well. Research specialists had to be made aware of their responsibilities as teachers. Research and teaching had to go hand in hand.

Eliot's views rested on the assumption that Harvard students would receive a general academic education in their pre-collegiate training. Thus he insisted in his 1893 report on secondary school studies that a general academic education be offered in all secondary schools to all students.[14] He thus asked, in effect, that diversification in secondary studies be greatly reduced in favor of a common general education and postponed to the college and graduate years. His plea was to fail. American secondary education remained diversified and when, with the arrival after 1918 of the comprehensive American high school a general education program was introduced, it did not necessarily offer a strong academic preparatory curriculum for all college-bound students.[15] At Harvard and in other colleges Eliot's elective program was thus curtailed and balanced in the first two undergraduate years with studies in general education. In the undergraduate colleges, then, diversification reached its limits.

The American Pattern:

Did diversification in United States higher education follow a path different from that in Europe? If we compare the influence of state policy and industrial development on research and service and if we trace the growth of professional associations among scholars and scientists we shall find little difference on either side of the Atlantic. The interweaving of university research with demands of industry and business or with governmental and administrative directives reached full strength to-

12. See Gladys Bryson, "The Emergence of the Social Sciences from Moral Philosophy," *International Journal of Ethics,* 42 (1932), 304–323.
13. See Hugh Hawkins, *Between Harvard and America: The Educational Leadership of Charles W. Eliot* (New York, 1972), 92–94.
14. Known as the report of the Committee of Ten, the document is titled, *Report of the Committee on Secondary School Studies Appointed at the Meeting of the National Education Association, July 9, 1892* (Washington, D.C., 1893).
15. See *Cardinal Principles of Secondary Education: A Report of the Commission on the Reorganization of Secondary Education, Appointed by the National Education Association,* United States Bureau of Education Bulletin No. 35, 1918 (Washington, D.C., 1918).

wards the last quarter of the nineteenth century and has continued unabated ever since. It became a moot question whether scholars could be "free" when every aspect of their professional lives from finding employment to obtaining funding bound them with a thousand ties into the economic and political structures of their nation. The college as ivory tower no longer existed, and diversification obscured even the possibility of defining clearly the scholar's uniquely "academic" task. In these areas it became difficult, if not impossible, to discern differences in the effects of diversification on the two sides of the ocean.

But the case appears in a different light when one looks at teaching. Here history and tradition tell another story. In France the closing of the old universities and the creation of a national system of higher education and in Prussia the founding of the University of Berlin marked the marriage of the modern state and higher education. This, however, occured before and at the beginning of the nineteenth century at roughly the same time when educational policies in the United States moved in the opposite direction. In its decision in the Dartmouth College Case of 1819 the United States Supreme Court protected colleges and universities against government interference in their affairs and declared laissez-faire to be national policy in matters both of business and higher education. Thus while in much of Europe higher education came under government control, in the United States the private institutions of higher education were given their magna charta. Private enterprise was encouraged to design colleges and universities independent of public directives. In France and Prussia centralized planning for both secondary and higher education, linking the one with the other in a system of initial preparatory general education with subsequent professional specialized training, reserved diversification for all practical purposes to the universities.[16] In the United States the "release of energy" during the early national period stimulated the early onset of diversification in both preparatory and collegiate education.[17]

The effects on university teaching soon became apparent. While in Prussia diversification was built into the faculty structure of universities or, in France, was given in the very task assigned to the institutes or higher schools and increased gradually with the growth in numbers of students and of academic fields, in the United States the diversification among colleges tended to hold back curricular diversification within them. Eliot's long and only partially successful struggle for the elective system furnishes the best illustration for this contention. In Europe institutional and curricular diversification went hand in hand; in the United States the early beginnings of institutional diversification delayed curricular diversification. We may also note that in a comparative perspective, teaching in the university in contrast to research and service, retained a more central place in university concerns in the United States than it did in Europe. Curriculum as a word used to describe the offerings of a university was a term unfamiliar to European scholars, and was introduced widely into their debates only after World War II. These differences of approach to questions of teach-

16. I say "for all practical purposes" because I recognize the differentiation of secondary curricula into those stressing the humanities and others focusing on the natural sciences; see Fritz K. Ringer, *The Decline of the German Mandarins* (Cambridge, Ma., 1969), 31.
17. The phrase "release of energy" has been coined by James Willard Hurst in *Law and the Conditions of Freedom in the Nineteenth Century United States* (Madison, WI, 1956), 17.

ing and of the curriculum derive, in the last analysis, from differences in point of departure. Where, as in Europe, educational policy was centrally planned, such questions were evaluated primarily for the import they had on national policies and on the labor market. Where, as in the United States, donors, parents, and teachers influenced the decisions of college administrators, questions of pedagogy, teaching, and the curriculum were apt to loom large in public discussion of higher education.

As a final illustration of these differences, let us consider the effects of this different emphasis on university structure and organization. The German university of the late nineteenth century has often been recognized as the model for the new American institutions.[18] But rarely has it been pointed out that American universities did not adopt the German *ordinarius,* the full professor as head of a research institute and single representative of his discipline. Instead, American universities developed the department, consisting of several faculty members who, once promoted to full professorial rank, constituted a collegial unit for both research and teaching. In the more renowned universities these members shared administrative responsibility in rotation, their elected head serving for a time as *primus inter pares.* In the German university, however, the *ordinarius* served permanently with full responsibility over teaching, research, and service in his institute, and without the benefit of support from colleagues of equal standing to share with him the burdens of administration. The *ordinarius* was *primus sine paribus.* Even had he wanted to he could not devote his undivided attention to teaching; his administrative responsibilities as head of a research institute came first. The American department head, on the other hand, knew that he would return to teaching and that, when during his tenure in office he was pressed with administrative duties, he had his colleagues who assumed the teaching duties of the department.

Large-scale institutional diversification in the United States therefore antedated its counterpart in Europe by roughly half a century, whereas the onset of curricular diversification within institutions took place nearly simultaneously. The effects of both institutional and curricular diversification on research, service, and professional associations were very similar on both sides of the Atlantic, while significant differences became apparent in academic teaching. The reason for these divergences and the early beginning of institutional differentiation in the United States must be seen in the different historical roles played by public authorities and private enterprise in the development of higher education in the United States and on the European continent.

18. I have discussed this topic in my *The German Historical School in American Scholarship* (Ithaca, NY, 1965).

Part Three: The Opening of Recruitment

Harold Perkin

The Pattern of Social Transformation in England

Between 1850 and 1930 there took place in England a revolution in higher education. It was a revolution in the meaning, purpose, size and personnel, both staff and students, of the English universities, and it was arguably more profound than any change since the 13th century foundation of Oxford and Cambridge or before the transition towards mass higher education of the 1960s. In round terms it was nothing less than the transformation of the university from a marginal institution, an optional finishing school for young gentlemen and prospective clergymen, into the central power house of modern industrial society.

The measure of this revolution can be taken by asking what difference it would have made to English society in 1850 and again in 1930 if the universities had suddenly disappeared. In 1850—almost none. The 850-strong Oxbridge intake, mostly sons of landowners and clergy, could easily, like most of their class, have found alternative ways of passing the time and, if they wished, of qualifying for the Church or other liberal professions in foreign travel, military college, articled clerkships or the theological seminaries. Neither ordination for the Church, which took 38% of Cambridge graduates between 1800 and 1849, nor the professions of law, medicine, public administration and teaching, which took 21%, required a university degree, nor was a degree sufficient training for law or medicine. Hardly any Oxford or Cambridge man, even of the handful (6% at Cambridge) who came from business families, went into business.[1] The only occupation which might have suffered, and that a largely unpaid one, was politics—and most peers and M.P.s did not have a degree.

The 375 or so full-time internal students at London University in 1861 and the 50 at Durham were scarcely more relevant to the needs of the new industrial society of mid-Victorian England, apart perhaps from the majority who studied medicine and

1. Lawrence Stone, "The Size and Composition of the Oxford Student Body, 1580-1910" in L. Stone, ed., *The University in Society* (2 vols., Princeton, 1974), 1 :91-2, tables 1 A and 1 B (for both Oxford and Cambridge admissions); Fritz K. Ringer, *Education and Society in Modern Europe* (Bloomington, 1979), 236 (for social origins and subsequent careers of Cambridge students, abstracted from Hester Jenkins and D. Caradog Jones, "Social Class of Cambridge Alumni of the 18th and 19th centuries," *British Journal of Sociology*, 1 [1950] and a 1938 survey by the Cambridge University Appointments Board).

the few scientists and engineers; and most doctors and engineers were still trained on the job by a form of apprenticeship.[2]

The Broadening of Social Recruitment:

In the English as distinct from the Scottish universities, where in Glasgow as many as a third of the students in the 1830s were working-class, there was scarcely a single workman's son.[3] At Oxford in 1835 there was one and in 1860 no "plebeian," a term which embraced everyone below "gentleman" and the clergy,[4] and there is no reason to think that there were more poor students at Cambridge, London or Durham, where the fees ensured that only the middle and upper class could afford them. Even the middle class were mostly absent from Oxford and Cambridge. Nearly two-thirds (63%) of Cambridge students between 1800 and 1849 came from landed and clergy families, 21% from the liberal professions, and only 6% from business and banking.[5] All the Oxford students in 1835 and 1860 were sons of landowners, clergy and "gentlemen," though the 21 percent to 32 percent of the latter must have included some professional and business men.[6] In no university in Britain were women of any class admitted. In total the English universities admitted less than 0.3% of what is now called the student age group, and if the Scottish universities admitted a larger share of a smaller population, most of these were between 15 and 18 years old and were not university students in the modern sense at all.[7]

As for the academic staff, they were chiefly drawn, as Arthur Engel has shown for Oxford, from the "gentlemanly" classes. Between 1813 and 1830, 45% of his sample were sons of clergymen, 28% of squires, armigers and "gentlemen," 15% of business and professional men, and only 5% from the "non-gentlemanly" classes. As late as the years 1881 to 1900 over 80% still came from the gentlemanly classes.[8] More to the point, most of the dons at Oxford and Cambridge were "poor relations," young men of good parentage but little inherited wealth, who became temporary celibate fellows while they waited their turn for a college living in the Church which they needed because their families lacked the patronage or wealth to provide one. Only 15% remained in the university for life, either because they gained a professorship or headship of a college which allowed them to marry or because a Church living never came their way. The professors at London and Durham, almost all recruited from Oxford and Cambridge, only differed from most dons in that they had gained a life appointment with freedom to marry similar to the Oxbridge professors and heads of houses.

2. Figures from R. A. Lowe, Table 1, in his contribution to this volume; for the preponderance of medical students at London University and other civic colleges see W. H. G. Armytage, *Civic Universities* (London, 1955), 170–75.
3. Michael Sanderson, *The Universities and British Industry, 1850–1970* (London, 1972), 148.
4. Stone, 93.
5. Ringer, 236.
6. Stone, *loc. cit.*; Ringer, 239.
7. Sanderson, 149; Harold Perkin, *Key Profession: The History of the Association of University Teachers* (London, 1969), 6.
8. Arthur J. Engel, "From Clergyman to Don: The Rise of the Academic Profession in 19th-century Oxford" (Diss., Princeton University, 1975) Appendix 2.

Only these few career academics would have permanently missed the universities of 1850.

Nor could the English universities claim to be vital to intellectual culture or scientific research. Not one of the intellectual giants of the early 19th century (Bentham, Coleridge, Malthus, Ricardo, Davy, Faraday or Darwin) was a university don, and the few academic scientists like Wheatstone, Daniell and Lyell were only to be found at the new University of London. The Royal Commission of 1852 on Oxford feared that "the clergy and gentry who are educated at the university" would in their ignorance of physical science be left behind by their social inferiors, to the serious injury of both science and other branches of knowledge.[9]

Lest it should be thought that Scotland was more advanced—as it certainly had been in the 18th century with the European leadership of Adam Fergusson, Dugald Stewart, Adam Smith, John Millar and the Scottish historical school of philosophy—one Scottish historian has talked of "the intellectual paralysis of intellectual life associated with Victorian Scotland." If that is exaggerated, the undergraduate faculties of Scottish universities were really secondary schools for 12- to 17-year-olds—"miserable filthy little urchins" as *Blackwood's Edinburgh Magazine* called those of Glasgow in 1823.[10] Their output, chiefly of kirk ministers and village dominies, was no more relevant to modern industrial society than that of Oxbridge.

In sum, the universities of Britain in 1850 could have been abolished with no great loss to the British economy and society. They were, indeed, less important than in the early 17th century, when on the eve of the Civil War they had educated 1.1% of the age group, over three times the percentage of 1850.[11]

By contrast, what if the universities had disappeared in 1930? That would have inflicted an immense loss on society and industry. By that date there were, including the five Scottish ones, 22 universities and university colleges in receipt of Treasury grants (24 if we include the unfunded colleges at Hull and Leicester) and 58 institutions if we count the separately funded colleges and schools of London and the University of Wales. They catered to about 50,000 students, representing 1.7% of the age group, or at least six times the percentage of 1850.[12] More important, it was a more critical percentage, a true elite which would supply most of the top positions in the Cabinet, the civil service, the medical and legal professions, and made a substantial contribution to the owners and managers of banking and big business.

As for the social origins of the students, the universities now catered, if unequally, to the whole social range. Nearly a quarter (23%)—more than a quarter of the men (27%)—were children of manual workers, a larger percentage than in any other West

9. *Report of the Royal Commission on the University of Oxford* (1852), 79–80.
10. "Vindiciae Gallicae," *Blackwood's Edinburgh Magazine*, 13 (1823), 94: the undergraduate Faculty of Arts was "a school where boys from twelve years of age to sixteen or seventeen" were instructed in elementary Classics, Mathematics, Logic, Ethics, etc., and were not to be compared with those of Eton, Westminster, Winchester, or Harrow (English grammar boarding schools).
11. Stone, 103.
12. University Grants Committee, *Report for the Period 1929–30 to 1934–35* (London, H. M. S. O., 1936), 11; Robbins Committee, *Report on Higher Education* (London, H. M. S. O., 1963), 16.

European country.[13] Although the child of a professional or managerial father had over 30 times the chance of getting to university of that of an unskilled worker, what has more often been overlooked is that only about one-third of upper class off-spring got there, which meant that two-thirds were beaten in the climb up the educational ladder by children from below.[14] Women, too, now found a place there, with 23% of the student body, though fewer of them (13%) came from the working class.[15] (To complete the picture we should add the large non-university sector of higher education, mainly teacher training and technical colleges, which contained another one percent of the age group and far more women and working-class students.)

The university teachers, too, had changed out of all recognition. No longer mainly clergymen waiting for permanent employment, they had become secular professional academics with a recognizably structured lifetime career. There is little information on their social background until after the Second World War. Of those in a 1968 sample who had entered university service before 1945 most, 83.2%, came from the professional and managerial classes and only 5.3% from the working class; but what is perhaps more significant is that the largest group, 42.5%, came from lesser managerial and professional families and, if we add the non-manual workers, half (49.6%) came from the lower middle class, and more than half (54.9%) from below the top social class.[16] Allowing in the latter for professional and salaried fathers with very little capital, there can be little doubt that the vast majority of academics were middle-class men (only about 10% were women, as now) with little family wealth and wholly dependent on their university salaries. As the best examinees of their peer group, they reflected belatedly the changed composition of the student body, but with a bias towards the scholarship boy from the grammar and direct grant schools, from which came no less than 72.3 percent. Although the largest single group, 43.4%, were graduates of Oxbridge, where nearly half came from the public boarding schools, only 22.3% of the university teachers were boarding-school products—a much smaller percentage than in most elites in Britain at that time.[17] University teaching had become a meritocratic profession mainly for the bright but poorer sons of the middle class.

The Rising Importance of Higher Learning:

Meanwhile the whole meaning and purpose of the university as an institution had changed. Apart from educating a large fraction of the elite in most occupations and acting as a narrow but effective channel of social mobility especially from the lower middle ranges of society, the university had come to play a much more central role in the economy and indeed in matters of life and death. Michael Sanderson has chronicled the increasing involvement of the universities from the late 19th century on-

13. The figures are for those of university admission age (18) in 1928–47 and are taken from Jean Floud "The Educational Experience of the Adult Population of England and Wales as at July 1949" in D. V. Glass, ed., *Social Mobility in Britain* (London, 1954), cited by A. H. Halsey, *Trends in British Society Since 1900* (London, 1972), 189, 219.
14. Figures from Jean Floud, cited by Ringer, 243.
15. Halsey, 217 and 219.
16. Perkin, 262.
17. Perkin, 259, 260.

wards in industry, beginning with shipbuilding, chemicals and electrical engineering and continuing with man-made fibers and plastics, pharmaceuticals, dyestuffs and electronics, a development to which we shall return.[18] Beyond that, university science had begun to explore the keys to life in cellular biology, bacteriology, virology, genetics, and to death as well as life in atomic research. One has only to recall a few of the names—Rutherford in nuclear physics, Fleming in antibiotics, Blackett in operational research—to realize how blindingly relevant the universities had become to the survival of man on this planet.

On a humbler level, the universities had begun to take over from apprenticeship and the professional institutions the advanced education of most of the higher professions. As the Vice-Chancellor of London University put it, belatedly in 1946, "The truth is that all the professions are pressing us, as universities, to take on the greater part, if not the whole, of the requisite professional or technical training for their own professional subjects." He went on to mention accountancy, veterinary medicine, estate management, youth leadership and journalism[19]—marginal professions compared with those which had already been absorbed. The U.G.C. annual listings from 1925–26 of "branches of study in which advanced students were engaged" chronicle this trend: 7 kinds of engineering, 10 of agricultural science, at least 12 industrial technologies from aeronautics and brewing to oil and textiles, 28 specialisms in medicine, and a new and burgeoning range of economic and social sciences.[20] We must not exaggerate the extent to which the universities were the progenitors of a more qualified, professional society, but academics were already on the way to becoming the key profession, the profession which provides both the expertise and the experts for most of the other professions.[21] If the universities had disappeared in 1930, they would have left a gaping hole in the social and industrial fabric—and Hitler would have won the Second World War.

It would be interesting to trace the stages by which this extraordinary change between 1850 and 1930 in the meaning, purpose, size and personnel of universities came about. The story would begin with the seething discontent of the new industrial classes at the exclusiveness and complacency of Oxford and Cambridge, which had come to monopolize for the Anglican clergy and gentry a national resource originally founded for poor scholars. It would follow the movement for reform both outside Oxbridge, in the effort to found alternative institutions for middle-class sons in London and the great industrial cities, and inside, with the help of parliamentary pressure coming to the aid of clerical dons seeking a lifelong career compatible with marriage and an opportunity to study and teach more relevant subjects like history, modern languages, the physical sciences and economics. It would bring in their increasing involvement in industry, with massive donations from industrialists on one side and on the other the penetration of academic inventors and consultants into the process of technological advance. It would show the increasing financial support of

18. Sanderson, *passim*.
19. *Home Universities Conference, 1946: Report of Proceedings* (Association of Commonwealth Universities, London, 1946).
20. University Grants Committee, *Returns from Universities and University Colleges* ... (annually from 1925–26 onwards) (London, H. M. S. O., 1926).
21. Cf. Perkin, *Key Profession*, Chap. 1.

the state from the first minute grant of £ 15,000 to university colleges in 1889, through the establishment of the Department of Scientific and Industrial Research in 1917 and of the U.G.C. in 1919, to the shouldering by the 1930s of about one-third of university expenditure and the consequent "remote control" of academic remuneration. Above all, it would trace the construction of an educational ladder, from the higher grade elementary schools of the 1880s and the state-supported secondary schools of 1902 through the grammar school scholarship of 1907 to the state and L.E.A. university studentships from 1920 onwards.[22]

This story has, however, been more than adequately chronicled by Armytage, Sanderson, Sheldon Rothblatt, Arthur Engel and others.[23] In the space available it is more important to ask why this revolution took place at all, and why in so short a time, in what was by any standards the most aristocratic, conservative and class-ridden of modern industrial societies. It is not enough to point, with A. H. Halsey, to "the remarkable absorptive capacity, the judicious and un-Marxist Fabianism of the upper classes."[24] The upper classes were not Fabian except perhaps in the original Roman sense of knowing when to retreat to still stronger positions, and attitudes are not causes but effects which themselves need explanation. Just as the most important reason for the first Industrial Revolution can be found not in the progressive attitudes of English landlords but in the material self-interest underlying those attitudes—they stood to gain in increased rent from the enclosures, mines, canals, railways and new towns[25]—so their part in the early stages of the university revolution can best be explained by self-interest, including their interest in political survival and the art of compromise to avoid something worse.

But first we must rid ourselves of the unhistorical and intellectualist fallacy that the universities before the great transformation were as important to the ruling classes as they have since become to intellectuals. It is salutary to be reminded how contemptuous the old landed class could be of academic pursuits. As a student one of my friends, now a senior Oxford don, was found reading by his fox-hunting aunt, a female squire. "What!" she said, "Are you still reading a book? Most unhealthy! Why don't you get out and ride a horse?" There were aristocratic politicians in 1850 who were scholars, like the Earl of Derby who preferred translating Homer to being

22. Cf. A. H. Halsey, A. F. Heath and J. M. Ridge, *Origins and Destinations: Family, Class and Education in Modern Britain* (Oxford, 1980), 25: the proportion of scholarships or "free places" in grammar schools rose from a required 25% under the 1907 regulations to an actual 45% in 1931 (drawn mainly from the less affluent middle class and the upper working class). See also R. H. Tawney, *Secondary Education for All* (London, 1922), 20: "The number both of pupils and school places in 1922 is ... all too small. But, inadequate as they are, they represent something like an educational revolution compared with the almost complete absence of public provision which existed prior to 1902" (quoted *ibid.*). A more detailed account may be found in G. A. N. Lowndes, *The Silent Social Revolution* (2nd ed., Oxford, 1969).
23. Armytage, *op. cit.*, Sanderson, *op. cit.*, Sheldon Rothblatt, *The Revolution of the Dons: Cambridge and Society in Victorian England* (London, 1968), Engel, *op. cit.*
24. A. H. Halsey, "British Universities and Intellectual Life" in A. H. Halsey, J. T. Floud and C. A. Anderson, eds., *Education, Economy and Society* (London, 1961), 506.
25. Cf. Harold Perkin, *The Origins of Modern English Society, 1780-1880* (London, 1969), esp. chap. 3.

Prime Minister, or Peel and Gladstone who both took double firsts at Oxford. But the great majority thought brain work only marginally superior to manual work and, when necessary to their well-being, preferably done by other people for the pitiful wages it was worth. Education was mainly valued for the group unity and social superiority it brought, including the ability to understand the Latin tags in parliamentary speeches, but this was more a product of the great public schools than of the ancient universities, which were "optional extras." As for the modern universities, they were objects of charity for the lower orders, much like the village church schools on a larger scale, important for political support and social control, but on no account to be attended by one's own children.

The defence of the privileges of Oxford and Cambridge was really the defence of the Church of England monopoly, which by 1851, when it was discovered that only a minority of the population attended the established Church,[26] had beome indefensible. Even Gladstone, M. P. for the University and a high Anglican and loyal alumnus, was not prepared to defend it and introduced the bill to reform Oxford himself.[27] It was, like the 1832 Reform Act or the Repeal of the Corn Laws, a concession which gave nothing vital away. The dissenters would be pleased and, as long as Latin and Greek were prerequisites for admission, the sons of the clergy and gentry and those professions which chose to be "civilized" in the public schools would still have the edge over all competitors. Moreover, once Oxford and Cambridge were reformed it became possible to justify new forms of privilege, such as their near-monopoly of the competitive examinations for the civil service from 1870. Reform was a retreat to a stronger position.

In the same way the new civic universities could be tolerated and even encouraged with royal charters and, eventually, government funds because they infringed upon no aristocratic interest, they drew middle-class political support, and they were, in their view, only a higher form of that "technical instruction" which the government already supported via the Science and Art Department from the 1850s and the "whiskey money" after 1889.[28] It was also in the national interest and in the interests of increased urban rents if the country was prosperous in the face of international competition. It would be a mistake, however, to attach too much importance to the fear of foreign competition engendered by the international exhibitions of 1851, 1867, and 1878.[29] This may have been a factor in state support for evening classes and technical colleges but at the university level it assumes at too early a stage a strong and direct connection with industrial employment which was simply not there. Only seven percent of Cambridge graduates in 1850–99 went into business, including banking, and though the figures for London or the civic and Scottish universities are patchy, the percentages there around the turn of the century were not much greater.[30] The great majority of graduates both from Oxbridge and from the provincial universities down to the First World War went into the professions, including the clergy (dissenting as

26. *Census of England and Wales, 1851: Religious Worship* (London, H. M. S. O., 1854).
27. John Morley, *Life of Gladstone* (London, 1908), 1:369–79.
28. O. M. V. Argles, *From South Kensington to Robbins: An Account of English Technical and Scientific Education since 1851* (London, 1964), chap. 2.
29. Cf. Argles; Armytage, 219–22.
30. Ringer, 236; Sanderson, 100–101, 111–14, 173–79.

well as Anglican), public administration, law, medicine and teaching. Even the scientists and engineers tended to prefer public employment, teaching or private professional practice to industry.[31] Industrialism was certainly the main driving force behind higher education, as it was behind the expansion of the professions, but it was industrialism in the broadest sense of the growth of a new urban class society demanding more and better professional and administrative services, not in the narrower sense of the employment needs of industry itself. These could still best be met, it was generally agreed, by training on the job supplemented by mainly part-time technical instruction below the university level. With a few significant exceptions in particular science and engineering departments where the seeds of the future were being sown,[32] the new and reformed universities down to the early years of the 20th century were chiefly schools preparatory to the literate and liberal professions and instruments for turning the sons of the other classes, whether landowners, business men or the few, notably in Wales and Scotland, from the working class, into professional men.

The Causes of the Social Transformation:

We are thus left with a paradox. If the reforms and new foundations of the Victorian age had only succeeded in changing the universities from finishing schools for young gentlemen and prospective clergymen into preparatory schools for the professions, how then did they manage to become by 1930 so vital to modern industry and society? Mainly because of changes *outside* the universities which transformed the structure of demand for their products, both for knowledge and for graduates. These changes, which began in the late 19th century and came to full fruition in the inter-war period, can be summed up as follows:

1) the rise of big business and with it of a plutocratic class by an amalgamation of the new millionaires with the old great landowners;
2) the relative decline of the landed gentry (the rural squires) and of the clergy whose incomes were heavily dependent on falling agricultural prices;
3) the emergence of new science-based industries closely linked to university research and graduate employment;
4) the growth of state administration and its more direct involvement in the economy and social life;
5) the narrowing, by taxation and educational policies as well as by big business and big government, of the channels of social recruitment and their concentration in the system of education and qualification.

The rise of big business between the 1880s and the 1920s is well-known in its economic aspects, but its social effects have been little studied. The number of joint-stock companies rose from 11,000 in 1888 to about 65,000 in 1914,[33] but more to the point was the rise of giant enterprises like Lever Brothers, Courtaulds, J. and P.

31. Sanderson, *loc. cit.*
32. Sanderson, esp. 83-93, 107-11, 160-65.
33. Sir John H. Clapham, *An Economic History of Modern Britain* (Cambridge, 1926), 3:202, 222.

Coats and Brunner-Mond, predecessor of I. C. I. The social effects of this development, coupled with those of the so-called "Great Depression" of 1874–96 on agricultural prices and rents, were profound. The wealth and status of the majority of the landed class were undermined, but the richer landlords, like the great London dukes with urban property, mines and other resources were joined in a new plutocratic, London-based class by great capitalists, many of them self-made millionaires like Lord Leverhulme, Lord Northcliffe, Cecil Rhodes and Sir Thomas Lipton.[34] The aristocracy rushed to diversify their holdings and incomes, on the one side to join the boards of joint-stock companies—one-quarter of the peerage became company directors by 1896—and on the other side to join the "flight from the land" which, after the 1909 "People's Budget" with its supertax and threatened land taxes, began the biggest transfer of land since the Conquest.[35] The plutocrats were few, however, and for most of the upper class a leisured life on the land was no longer an automatic right. Their children would have to fend for themselves and compete, admittedly with competitive advantages, with others for the top jobs in society.

The decline in agricultural rents and prices, to which the clergy's incomes were tied, removed overnight the attraction of the main alternative career for younger sons and for the sons of the clergy themselves. At the same time the secular professionalization of college fellowships removed another reason for ordination.[36] The proportion of Cambridge graduates going into the Church plummeted from 38% between 1850 and 1899 to six percent in the 1930s. The two largest classes which still between 1850 and 1899 supplied 50% of Cambridge graduates clearly had to find other jobs to do, often without higher education, and their numbers fell to nine percent by the 1930s. Their places were taken partly by children of the professional class, who increased from 26% to 30% of a much larger student body, but much more by those of the business class, who increased from 15 percent to 46 percent.

Still more striking was the change in social destinations. The share of those going into the Church and landowning as a career shrank from 45 percent to six percent (0% in land) and they were replaced partly by an increase in professional employment from 39% to 49%, still more by an increase of those going into business from seven percent to 31 percent.[37] Sanderson's figures show larger percentages of Cambridge graduates going into industry and business between the Wars, rising to 52% in 1929 and averaging 40% for the whole period.[38] Oxford, allowing for its larger weighting of arts degrees, had a similarly dramatic increase in business careers, from seven percent between 1906 and 1910 to 31% in 1938, and averaging 24% in the 1920s and 1930s.[39] Curiously enough, apart from Birmingham, Liverpool and Newcastle, which averaged 32%, 52% and 64% in the early 1920s, most provincial universities had smaller proportions going into business than Oxford and particularly Cam-

34. Cf. F. M. L. Thompson, *English Landed Society in the 19th Century* (London, 1963), chap. 11; and Harold Perkin, "Land Reform and Class Conflict in Victorian Britain" in John Butt and P. F. Clarke, *The Victorians and Social Protest* (Newton Abbot, 1973).
35. Thompson, 306-07, 321-26.
36. Cf. Engel, 467.
37. Ringer, 236.
38. Sanderson, 279.
39. Sanderson, 279.

bridge.[40] This underlines the fact that the upper and upper middle classes who still dominated Oxbridge were much quicker to seize the new opportunities in business, and were more welcome as recruits with "the right social background" than provincial graduates. Such indeed was the aim of the Appointments Boards set up in Oxford and Cambridge in the 1890s with the help of business men like Sir Douglas Fox, Lord Rothschild and Nathaniel Cohen with the express purpose of recruiting graduates for big business.[41] Even an Oxbridge arts graduate, it was assumed, was a better prospect for management than a provincial scientist or engineer, and it is noticeable that the graduates from other universities were nearly all scientists and engineers, mainly recruited for research and production and only rarely for management training.

Graduate scientists and engineers, however, were certainly needed for the new science-based industries of the 20th century. Many of these, such as steam turbines, electrical engineering, electronics and broadcasting, dyestuffs, pharmaceuticals, man-made fibers and petrochemicals, were based on fundamental research done mainly in 19th century universities, often with active collaboration between industrialists and professors like Sir Henry Roscoe, Lord Kelvin, MacQuorn Rankine and J. J. Thomson. Such science professors acted not only as consultants but as recruiting agents between their students and business, and their departments became the seedbeds of whole new industries.[42] By the inter-war period the universities had become vital to the development and survival of the most advanced and rapidly growing sectors of British industry.

The growth of big government which began in the late 19th century also provided opportunities for graduate employment and academic consultancy. The number of civil servants which had scarcely kept pace with population for most of the 19th century leapt from 50,859 in 1881 to 116,413 in 1901, to 317,721 in 1922 (during the post-War decline) and to 350,293 in 1936.[43] The increase was due to the growth in government responsibility for an ever-widening range of services, including education, public health, factory inspection, industrial arbitration and conciliation, as well as the rising scale of military operations, and above all to the incipient rise of the welfare state, which took central government offices for the first time (except for the Customs and Excise) into every provincial town and placed new burdens on the local authorities as well. By no means all the new civil servants and local government officials were graduates but those in the higher echelons were, and the highest grade of the civil service was almost exclusively recruited from Oxford and Cambridge.[44] At lower levels, such as factory inspection and social work, other graduates could find a foothold. The London School of Economics, for example, set up the first course in welfare work.[45] The universities, and especially Cambridge and London began in-

40. Sanderson, 279.
41. Sanderson, 55–58.
42. Sanderson, 100–101, 111–14, 173–79.
43. H. Finer, *The British Civil Service* (London, 1937), 24.
44. Cf. R. K. Kelsall, *Higher Civil Servants in Britain from 1870 to the Present Day* (London, 1955).
45. Lord Beveridge, *The London School of Economics and its Problems, 1919–37* (London, 1960), 86.

creasingly to furnish the government with consultants on social and economic problems like J. M. Keynes, R. H. Tawney and W. H. Beveridge, though it did not always accept their advice.[46] Here again the universities found themselves at the heart of one of the most far-reaching developments of modern society, the expanding corporate state.

The combined effect of all these four developments was to converge on the fifth, the channelling of recruitment to most of the elites in society through education and the qualification systems, at the apex of which now stood the universities. Given the closing of other avenues, into leisured landownership or the Church, even the children of the upper class were forced to seek higher education if they wished to be certain to reach the top. With the rise of big business and the operation of super-tax and death duties it became more difficult (though not impossible) for middle-class and the few working-class entrepreneurs to build up a business and make a fortune,[47] and so hopes of social mobility were channelled towards education. The educational ladder itself diverted middle and working-class talent away from traditional forms of social climbing, and many a potential self-made man became a professor or a civil servant instead. The ladder brought talent from below into competition with the children of the higher classes. By a quirk of the English system it was easier for a really bright but poor child to go to Oxford or Cambridge than to a provincial university since, after the reforms of the 1870s, there were far more open scholarships there to be won. Although the scholars were few, they had by definition to be good at competitive examinations, and they tended to get better degrees and a larger share of university fellowships and civil service places, which accounts for the rapid shift in those professions towards recruitment from the lower middle ranges of society.[48] Thus the competition was immediately felt by the sons of the higher classes, who had to strive harder in the educational competition or shift their attention to careers where social background and "character" gave them an advantage, in business and the socially superior and more expensive professions such as law and medicine.

The net result of this convergence of recruitment upon the educational route was what may be called a "threshold effect." With dramatic suddenness, between the first and third decades of the 20th century the percentage of the age group enrolled in universities doubled, from 0.8 percent to 1.5 percent. Higher education became fashionable, almost a necessity, even for the rich who wished to reach the top of the great functional elites and even for those who came from the business class and/or hoped to get into management. They avoided the provincial universities, but both Oxbridge and the rest became more vital to the middle classes, both for those who followed the now traditional routes into the professions and the more adventurous who were will-

46. Keynes was an economic adviser to the British delegation to the Versailles Treaty conference, 1919; Tawney the leading member of the Hadow Committee on secondary education, 1926; and Beveridge's contributions range from assistance to Churchill over labor exchanges, 1909, to his famous report on *Social Insurance and Allied Services,* 1942.

47. For the changing social origins of large company chairmen and millionaires, see H. J. Perkin, *Elites in British Society since 1880* (unpublished report to S. S. R. C., 1976, deposited in British Library Lending Division).

48. Perkin, above, and "The Recruitment of Elites in British Society since 1880", *Journal of Social History,* Winter 1978.

ing to take their chances in business. For bright boys and (fewer) girls from the working class all their hopes of social mobility came to center on the grammar school and university, preferably Oxbridge. For all classes the university became the normal route to high status and income. This was an aspect of the rise of professionalism as the guiding principle of modern society.

Thus the revolution in British higher education, though from one point of view occupying the whole period between 1850 and 1930 and by no means complete even then, from another passed its critical turning point almost overnight, between, say, 1900 and 1920. The war, though not itself the cause, accelerated the transition, by extending the role of the state, challenging the automatic leadership of the traditional ruling class, bringing forward new leaders from the ranks, and shaking up old assumptions about what men—and women—from different social backgrounds could do and not do. But the causes lay much deeper, in the profound shifts in income, social structure and expectations about the distribution of life chances which began in the late 19th century. At the risk of massive oversimplification of complex developments, the revolution may be summed up in a sentence. Before, 1900, despite many undercurrents of change, the universities are still in the world of leisured gentlemen and the gentlemanly professions; after 1920, despite many hangovers from the past, they are in the bustling, strenuous world of business and the competitive professions, where serious preparation for high status and incomes is channelled increasingly through higher education. By the 1920s the university is no longer a finishing school for young gentlemen; it is the central power house of modern industry and society.

John E. Craig

Higher Education and Social Mobility in Germany

To say that the period 1850–1930 brought dramatic changes in the relationship between higher education and the German social order is to contribute nothing to knowledge. Given the rapid pace of industrialization and urbanization in these years one could hardly expect the educational system to have remained immune. In any event the more manifest changes have long been documented. This is particularly true in the case of the background characteristics of the university students. German statisticians, reflecting the contemporary concern with the changes at work, were far ahead of their counterparts elsewhere in the collection and analysis of data on the origins of students according to father's occupation, religion, secondary schooling and so on. The results have provided the basis for a number of studies of the social transformation of the German university.[1] Indeed for the period under consideration more is known about the origins of German university students than about the backgrounds of students in any other country.

But do we know enough? No, we do not, because none of the existing studies has carefully examined the relationship between the social origins of university students and the social origins of the populations at risk. It should be noted that the subject

1. Recent studies based on these results include Werner Conze, "Sozialgeschichte 1850–1918," *Handbuch der deutschen Wirtschafts- und Sozialgeschichte,* ed. by Hermann Aubin and Wolfgang Zorn (Stuttgart, 1976), 2:675–78; Konrad H. Jarausch, "The Social Transformation of the University: The Case of Prussia, 1865–1914," *Journal of Social History,* 12 (1979), 609–636; Hartmut Kaelble, "Sozialer Aufstieg in Deutschland 1850–1914," *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte,* 60 (1973), 41–71; Hartmut Kaelble, "Chancenungleichheit und akademische Ausbildung in Deutschland 1910–1960," *Geschichte und Gesellschaft,* 1 (1975), 121–49; Hermann Mitgau, "Soziale Herkunft der deutschen Studenten bis 1900," *Universität und Gelehrtenstand 1400–1800,* ed. by Hellmuth Roessler and Guenther Franz (Limburg, 1970), 233–68; Hans-Werner Prahl, *Sozialgeschichte des Hochschulwesens* (Munich, 1978), 277–92, 311–16; Reinhard Riese, *Die Hochschule auf dem Wege zum wissenschaftlichen Großbetrieb* (Stuttgart, 1977), 40–48; Fritz K. Ringer, *Education and Society in Modern Europe* (Bloomington, 1979), 70–113; Wolfgang Zorn, "Hochschule und Höhere Schule in der deutschen Sozialgeschichte der Neuzeit," *Spiegel der Geschichte. Festgabe für Max Braubach zum 10. April 1964,* ed. by Konrad Repgen and Stephan Skalweit (Muenster, 1964), 321–39.

can be approached from two distinct and equally legitimate directions. It is important to know about the social composition of student bodies even if the degree to which it reflects the larger social order is unknown. It is important because it helps us to understand the dynamics of student subcultures and of recruitment into the professions. But to assess the likelihood that those of specific social backgrounds will receive a higher education we must also consider the sizes of the relevant social groups and age cohorts. Others have compared enrollment figures with proxies for the populations at risk.[2] Yet no study of the social transformation of German higher education or of any other system of higher education has introduced the precision needed if we are to understand the dimensions of the changes in question. It is a gap which this chapter attempts to narrow.

The Changes in Social Origins:

Between 1850 and 1930 the number of students at German institutions of higher education increased tenfold, from about 13,000 to 133,000.[3] But one would not expect this rate of growth to be the same for those of varying social origins, and it was not. Generally speaking, the numbers from the middle ranks of the social order increased more rapidly than the numbers from more privileged backgrounds, and within each of these groupings there was wide variation. The reasons will be considered below. The focus here is different; it is on the impact of the differing enrollment trends on the composition of the student bodies of universities and other postsecondary institutions.

To facilitate comparison, occupations considered have been grouped into six broad categories:

(1) The Educated Elite, composed of high government officials and lawyers, professors and teachers with university degrees, clergymen, doctors, dentists, pharmacists, veterinarians and military officers;
(2) the Entrepreneurial Class, comprising industrialists and merchants or bankers;
(3) the Old Middle Class, consisting of artisans and shopkeepers;
(4) the New Middle Class, including free professionals and teachers without university degrees, middle-ranking government employees, and white-collar workers in private firms;
(5) the Farming Sector, consisting of owners of landed estates *(Gutsbesitzer)* or landowning peasants; and
(6) the Working Class, defined as workers employed by the government, non-agricultural workers in private firms, and agricultural workers.

Because of the nature of their intended careers, students of pharmacy and dentistry are grouped with students of medicine. Students of cameralistics, the policy sciences *(Staatswissenschaften)* and related subjects are grouped with law students. Students of the humanities are distinguished from students of mathematics and the natural sciences even though most universities united them in a single faculty. For the period

2. Jarausch, 627; Kaelble, "Chancenungleichheit," 127-31; Mitgau, 244-45; *Preußische Statistik,* 167 (1901), 145-52.
3. Prahl, 381-82; Riese, 339-40.

preceding World War One the emphasis is on the students from Baden, Prussia and Württemberg, the three states for which the data are richest. (Together these states accounted for about 70% of Germany's university students.) For the period following the war data are available for German higher education generally, and they provide the basis for most of the analysis.[4]

The basic trends can be summarized succinctly. Judging from Württemberg, the state for which the data are most abundant, there was a pronounced decline between the 1830s and the 1930s in the proportion of students from the educated elite and more gradual declines in the proportions from the old middle class and the farming sector. By contrast, the proportions from the entrepreneurial class and the new middle class increased significantly. There was also a pronounced growth in the percentage from the working class, although in this case the numbers were small. In two periods the pace of change was particularly rapid: the 1870s and 1920s. Not coincidentally these were also the periods in which the total enrollment grew most rapidly.

In the periods for which comparable data are available the trends in Baden and Prussia closely paralleled those in Württemberg. It should be noted, too, that the trends for the country as a whole around 1930 were consistent with those in Württemberg and in prewar Prussia. This is particularly true if the comparisons are confined to the male students. Not surprisingly the female students, whose number grew rapidly in the 1920s, tended to come from more privileged backgrounds than the male students. The effect was to intensify some of the long-run trends (the decline in the proportion from the farming sector and the old middle class and the rise in the proportion from the entrepreneurial class) and to moderate or reverse others (the decline in the proportion from the educated elite and the rise in the proportions from the new middle class and the working class). But the number of female students was still relatively small—they accounted for 14.5% of the German students in 1928 and for 18.6% in 1931—and hence had little effect on the general trends (Table 1). Since it is far from obvious whether the total or the male enrollment should be used for comparative purposes, a flexible approach has been adopted; the tables present data for both male and female students, but the discussion leaves the female students out of account.

Of the individual faculties by far the most open (those with the highest proportions from modest origins) were the Catholic theological faculties. Between the mid-19th century and 1914 most of their students, usually more than two-thirds, were the sons of artisans, small craftsmen, peasants or members of the working class. At the other extreme, the educated elite and the entrepreneurial class never contributed more than one student in 10. Over time the most pronounced trends were the decline in the proportion from the old middle class and the rise in the proportion from the working

4. The data concerning the students are from Ludwig Cron, *Der Zugang der Badener zu den badischen Universitäten und zur Technischen Hochschule Karlsruhe in den Jahren 1869 bis 1893* (Heidelberg dissertation, [1897]), 73–78; Albert Rienhardt, "Das Universitätsstudium der Württemberger seit der Reichsgründung," *Württembergische Jahrbücher für Statistik und Landeskunde,* 1916, 256–79; Andreas Wuerthner, "Das Hochschulstudium der Württemberger nach dem Kriege," *Württembergische Jahrbücher für Statistik und Landeskunde,* 1932–33, 272–87; *Preußische Statistik,* 106 (1892), 326–29; 136 (1896), 328–41; 193 (1905), 34–37; 236 (1913), 34–37; *Deutsche Hochschulstatistik,* ed. by Hochschulverwaltungen, Sommerhalbjahr 1928, 20–61, and Sommerhalbjahr 1931, 12–53.

Table 1: University Attendance by Fathers' Occupations: Rates and Indices of Selectivity for General Occupational Categories

Württemberg (Male):

	1873	1879	1885	1891	1897	1903	1909	1933
Rates:								
Educated Elite	23.06	28.06	26.40	25.17	23.73	24.48	32.30	35.61
Entrepreneurial Class	7.88	12.03	16.46	9.78	8.49	6.99	8.12	15.62
Old Middle Class	.64	1.02	1.27	1.12	.98	1.24	1.72	3.35
New Middle Class	8.88	14.94	14.58	10.94	9.73	8.66	10.99	9.84
Farming Sector	.19	.37	.36	.26	.25	.29	.36	.58
Working Class	.28	.57	.56	.54	.46	.34	.51	.83
Other	6.31	10.11	15.92	12.02	14.40	12.59	41.23	7.46
Total	.92	1.49	1.66	1.41	1.38	1.39	1.83	3.33
N	543	852	972	911	987	1060	1384	3660.90
Indices of Selectivity:								
Educated Elite	25.21	18.86	15.86	17.84	17.26	17.57	17.64	10.71
Entrepreneurial Class	8.61	8.09	9.89	6.93	6.18	5.02	4.44	4.70
Old Middle Class	.70	.69	.77	.80	.71	.89	.94	1.01
New Middle Class	9.71	10.04	8.76	7.75	7.08	6.22	6.00	2.96
Farming Sector	.21	.25	.21	.18	.19	.21	.19	.17
Working Class	.31	.38	.34	.38	.33	.24	.28	.25
Other	6.90	6.80	9.57	8.52	10.48	9.04	22.52	2.24

Baden (Male):

	1873	1878	1883	1888	1893
Rates:					
Educated Elite	30.28	23.95	29.35	36.70	29.76
Entrepreneurial Class*	8.31	5.56	13.29	14.94	12.65
Old Middle Class*	.70	.60	1.00	1.90	2.20
New Middle Class**	9.12	6.61	10.23	14.59	12.26
Farming Sector	.23	.20	.19	.35	.56
Working Class**	.35	.38	.63	.65	.57
Other	42.83	34.48	44.74	38.62	27.51
Total	.94	.83	1.24	1.86	1.95
N	481.60	421.60	646.40	1029.60	1176.80
Indices of Selectivity:					
Educated Elite	32.47	29.02	23.71	19.69	15.26
Entrepreneurial Class*	8.88	6.74	10.74	8.01	6.49
Old Middle Class*	.74	.73	.81	1.02	1.13
New Middle Class**	9.75	8.01	8.26	7.83	6.29
Farming Sector	.24	.25	.15	.19	.29
Working Class**	.37	.46	.51	.35	.29
Other	45.77	41.78	36.14	20.72	14.11

Table 1 (continued)

Prussia (Male):

	1887	1893	1902	1911
Rates:				
Educated Elite	29.74	24.31	25.28	31.52
Entrepreneurial Class) Old Middle Class)	2.37	1.94	2.49	3.19
New Middle Class**	7.59	5.14	5.59	6.50
Farming Sector	.50	.42	.54	.67
Working Class**	.19	.15	.16	.25
Other	7.18	5.90	4.11	8.46
Total	1.47	1.21	1.41	1.67
N	14404.50	12272.60	17361.30	23807.50
Indices of Selectivity:				
Educated Elite	20.24	20.18	17.92	18.85
Entrepreneurial Class) Old Middle Class)	1.16	1.61	1.76	1.91
New Middle Class**	5.16	4.27	3.96	3.89
Farming Sector	.34	.35	.38	.40
Working Class**	.13	.12	.12	.15
Other	4.89	4.90	2.91	5.06

Germany:

	Male		Female	
	1928	1931	1928	1931
Rates:				
Educated Elite	51.62	43.92	16.85	20.24
Entrepreneurial Class	9.25	11.60	2.43	4.18
Old Middle Class	3.63	3.21	.65	.86
New Middle Class	8.02	6.52	1.59	1.97
Farming Sector	.69	.65	.08	.10
Working Class	.32	.43	.02	.05
Other	53.78	15.45	10.03	4.52
Total	3.02	2.79	.66	.86
N	74391.40	68566.70	10168.90	21010.80
Indices of Selectivity:				
Educated Elite	17.10	15.72	25.73	23.58
Entrepreneurial Class	3.06	4.15	3.71	4.87
Old Middle Class	1.20	1.15	1.00	1.00
New Middle Class	2.66	2.33	2.43	2.29
Farming Sector	.23	.23	.12	.12
Working Class	.11	.15	.03	.06
Other	17.81	5.53	15.31	5.26

*Based on the assumption that the ratio of the rate for merchants to that for small shopkeepers was the same in given years as in Württemberg.

**Based on the assumption that the ratio of the rate for middle-ranking civil servants to working-class government employees was the same in given years as in Württemberg.

class. Of course, because of the celibacy of the Catholic clergy these faculties did not contribute to upward mobility in the long run. Indeed, to the extent they attracted youths of modest origins who would otherwise have enrolled in the secular faculties, they tended to reduce the rate of upward mobility.

The pattern in the Protestant theological faculties was different. The majority of the students, usually at least 70%, came either from the educated elite or from the new middle class. In contrast, the sons of artisans, shopkeepers, peasants and members of the working class rarely accounted for more than a fifth of the total. The most striking trend was the rise in the proportion from the new middle class, evident throughout the period. This came largely at the expense of youths from the peasantry and the old middle class, although in the 1920s there was also a sharp drop in the proportion from the educated elite. It should be noted that usually about three-fourths of those from the educated elite—and more than a quarter of the total enrollment—were the sons of clergymen. Their number did not fluctuate much over time; put in economic terms, the elasticity of substitution was lower for the sons of pastors than it was for those of other origins.

For the humanities and the sciences the basic patterns and trends had much in common. In both cases enrollment was relatively low until the 1890s and then grew rapidly. In both cases students from the new middle class and the working class contributed disproportionately once rapid growth began, largely at the expense of the old middle class and the peasantry. In both self-recruitment was slight; most students in the humanities and sciences presumably expected to become teachers at the secondary or tertiary levels, but only about one in 20 was the son of a teacher at these levels. In both the proportion who were the sons of primary school teachers grew impressively before World War I and then, judging by the figures for Württemberg, declined. The only major differences between the patterns in the humanities and in the sciences were in the relative contributions of certain occupational sectors. Generally speaking, the scientific disciplines attracted larger proportions from the entrepreneurial class and the old middle class and a smaller proportion from the new middle class.

Throughout students of law and related subjects came from more privileged backgrounds. Over time, however, recruitment to these fields became more heterogeneous and democratic. Most striking were the decline in the proportions from the educated elite and the farming sector and the rise in the proportions from the entrepreneurial class and the new middle class. These trends were most pronounced when overall enrollment grew most rapidly, that is in the 1870s, 1890s, and 1920s. Important in this regard were shifts in the degree of self-recruitment. Self-recruitment was greater when total enrollment was low; the sons of lawyers and high-level bureaucrats were less responsive to general fluctuations in the relative popularity of legal studies than were students of other backgrounds.

With regard to selectivity there was little to distinguish the medical faculties from the law faculties. The proportions coming from each of the occupational categories were roughly the same, self-recruitment was comparable, and changes over time tended to be in the same directions and of similar dimensions. There seems even to have been a close inverse relationship between their respective enrollments: when recruitment to the law faculties grew rapidly and became less exclusive, as in the 1890s and the early and mid-1920s, recruitment to the medical faculties tended to stagnate

or decline and to become more exclusive, and vice versa. This suggests that these faculties functioned as rather good substitutes, with large numbers of students, particularly those of relatively humble origins, gravitating to one or the other in response to changes in perceived job opportunities.

There remains the matter of the students in other institutions of higher education—the *Technische Hochschulen* (schools of engineering), the *Handelshochschulen* (business schools) and the other specialized institutes and academies of university rank. Unfortunately for the period prior to World War I there are data covering an extended period for only one such institution, the *Technische Hochschule* at Karlsruhe in Baden. But these data together with those collected in the late 1920s and early 1930s for all of these institutions do suggest some general relationships.

To begin with, the *Technische Hochschulen,* which always accounted for most of the students in question, were no more open than the universities to youths of modest origins. Indeed between 1869 and 1893 the *Technische Hochschule* in Karlsruhe usually attracted proportionately more students from the educated elite and the entrepreneurial class than did Baden's two universities and proportionately fewer from the old middle class, the peasantry and the working class. The pattern was somewhat different in Germany as a whole around 1930, but the proportion from relatively humble origins was still somewhat smaller at the *Technische Hochschulen* than at the universities.

The other institutions can be divided into two groups. Those that prepared for careers in business, the bureaucracy or the free professions (the *Handelshochschulen* and the schools of agronomy, forestry, mining and veterinary medicine) exhibited patterns similar to those found at the universities. The chief difference was that smaller proportions of their students came from the educated elite and larger proportions from the entrepreneurial class and, in the schools of agronomy and veterinary medicine, from the farming sector. Institutions in the second group, which chiefly prepared for teaching careers at the secondary level, had much different appeals. The great majority of their students (more than 90% in 1931) came from the old middle class, the new middle class, the peasantry and the working class. But, as with the institutions in the first group, the numbers involved were relatively small; in 1931 the two groups together accounted for only 8.54% of the total enrollment in higher education. As a result, their impact on the overall distribution of students according to social origins was small; the pattern for German higher education as a whole differed little from that for the German universities.

The Pattern of Selectivity:

What lay behind these trends? If we are to understand the variations in the demand for higher education we need additional information. Most important, we need to know about the populations at risk. Was the decline in the proportion of students from the farming sector chiefly a reflection of a shrinking rural population? Did the rising proportions from the new middle class and the working class result primarily from growing per capita demand for higher education in these classes or from the growth of the size of these classes? More generally, was German higher education becoming more open or more exclusive? To answer such questions, data concerning

the social origins of students must be related to changes in the occupational structure of the population.

Although others have recognized this, few have examined the relationship systematically. The basic problem is that there can be wide differences among occupational groups in the likelihood that workers will have children in the age cohort responsible for most students at institutions of higher education.[5] Consider, for instance, the case of landless agricultural laborers. They can constitute a large proportion of the total work force (in Germany in 1895 they accounted for more than one-fifth of all male workers), yet relatively few were old enough to have children aged 20 or more, and a large proportion of those old enough were unmarried. The situation was similar for other large occupational groups, including the armed services, apprentices and journeymen, and, to a lesser degree, the industrial working class. Alternatively, those in the educated elite and the entrepreneurial class tended to be concentrated in the age groups most likely to have children in their early 20s. This suggests that to use the distribution of males in the occupational force to assess the selectivity of universities will indicate that recruitment was more elitist than in fact it was.

To avoid this problem the following analysis is based on a different approach. It involves estimating the numbers of males and females aged 20 to 23 according to their fathers' current occupations, and using them as the denominators when calculating selectivity. Since the value of these calculations depends on the accuracy of the denominators, a discussion of the estimating procedure is in order. The estimates are based on the German occupational censuses of 1882, 1895, 1907, 1925 and 1933, particularly the data concerning males in each occupational sector by age group (30 through 39, 40 through 49, and so on) and by the number of their children under 14. These data have been used to estimate for each occupational category the number of male and female children under 14 per male aged 28 to 41, on the assumption that the typical father of a typical child under 14 was 35 years old. These results were multiplied by the number of males in the same category who, 15 years later, were aged 48 through 51, that is when the typical child would be aged 20 to 23. The procedure is designed to control both for the career mobility of fathers between the median ages of 35 and 50 and for variations in fertility among occupational groups over time. The calculations for years after 1882 are based on linear interpolations of census data, while those for years before 1882 are based on logarithmic extrapolations from the censuses of 1882 and 1907. In all cases the results have been adjusted so that they are consistent with the actual numbers aged 20 to 23 in the relevant years as given in or interpolated from the population censuses.

The adjusted results have been used to estimate the rates of university attendance for each category for which data on the social origins of students are available. To facilitate comparisons the analysis is restricted to the occupational categories most commonly used in Germany between the 1880s and 1930s. In most cases these are more general than the most specific ones used in the occupational censuses, facilitat-

5. In the interest of comparability it is desirable to define the relevant age cohort as equal in length to the average length of time students spent at universities. For present purposes this has been defined as four years, and the most appropriate cohort as that from 20 through 23. A more refined analysis would make adjustments for the variations in average time enrolled both over time and among the faculties.

ing the task of determining rates of attendance. In the remaining cases multipliers based on other sources have been used together with census data to estimate the populations at risk. The distinction between the children of university-trained teachers and the children of other teachers is based on the number of male teachers employed in the educational institutions of various types. The proportion of all male landowners whose holdings exceeded 50 hectares is the multiplier used to distinguish the children of estate owners *(Gutsbesitzer)* from those of peasants. A similar procedure has been used to estimate the proportions of the children of owners of manufacturing or commercial firms whose fathers were large-scale industrialists or merchants rather than artisans or shopkeepers. In these cases the multipliers are based on the proportions of all male owners of firms who employed more than five workers. All multipliers have been adjusted for each year considered, where necessary through linear interpolations. Admittedly these procedures are arbitrary, but experimentation with other multipliers yielded less plausible rates and trends that hardly differ from those that emerge with the procedure adopted.

Since it is desirable to relate trends within specific occupational categories to the overall pattern, indices of selectivity have been estimated as well as rates of attendance. This is a simple procedure, for it merely involves dividing the rate for the group under consideration by that for the population generally. In the tables that follow the rate is given for each occupational group and both the rate and the index of selectivity are given for the more general occupational categories.

Two additional comments concerning methodology are in order. First, to avoid the wide variation across faculties and over time in the average number of semesters that students enrolled, the focus throughout is on the number of matriculants from various occupational groups rather than on the number enrolled at specific times. Where the available data concern only the latter, the ratio of new matriculants to all students at different times within each faculty or type of institution, which can be calculated, has been used to estimate the number of matriculants from each relevant occupational group.

Second, in determining rates of attendance and indices of selectivity it obviously is desirable to consider only the students from the state for which the denominators have been calculated, and to consider all such students. This poses no problems when data are available for all German students, for Württemberg or for Baden. In other cases, however, the data present difficulties. For Bavaria and Saxony there is abundant evidence concerning the social origins of those enrolled at the states' universities, but no distinction between those from within the states and those from elsewhere. Because of the resulting risks the data for Bavaria and Saxony have not been considered in this analysis. In Prussia there are data concerning those from the state studying within the state at specific times, but none on those from the state studying elsewhere or, as for Baden, on all those from the state who ever matriculated at one of the state's universities. In this case it has been assumed that Prussian students at other German universities—their numbers can be determined independently—were similar in social origins to those studying Prussia. While the higher mobility of students from the upper strata might make the university appear less elitist,[6] the ten-

6. Franz Eulenburg, *Die Entwicklung der Universität Leipzig in den letzten hundert Jahren. Statistische Untersuchungen* (Leipzig, 1909), 71.

dency of lower class students to exaggerate their social origins ought to cancel out this bias.[7]

In the early 1870s, judging from the evidence for Baden and Württemberg, about one quarter of the sons of high government officials and university-trained professionals in the appropriate age cohort attended universities. By the standards of the previous four or five decades this was probably a low rate. It almost certainly was lower than it had been during the enrollment boom of the 1830s when, for instance, the number of students in this group from Württemberg was a third again as large yet the number at risk was presumably much smaller. Since in the interim total enrollment had lagged behind population growth, it is likely that the rate for the educated elite had declined throughout the period.

But whatever the previous trends, following German unification the rate for the educated elite varied little. Although the number of students from this category increased significantly after 1870, the number at risk grew at about the same pace. Meanwhile the rates for other occupational groups rose, and as a result the relative position of the educated elite worsened. Thus in the two decades following unification the index of selectivity for the category fell from 25.21 to 17.84 in Württemberg and from 32.47 to 15.26 in Baden. In Prussia, judging from more aggregated data, the trend was similar. In other words, the rapid expansion of enrollment in the 1870s and 1880s worked against the perpetuation or reproduction of the established university-trained elite, the *Bildungsbürgertum.*

The subsequent decline in university enrollments—the rates of attendance of the late 1880s would not be reached again until after the turn of the century—slowed the trend but did not reverse it. The rate for the first occupational category declined even more rapidly than did the overall rate; the index of selectivity continued to decline, albeit at a slower rate than before. In the subsequent boom that characterized the decade before World War I the rate for the educated elite actually seems to have grown a little more rapidly than the overall rate. This indicates that expansion did not necessarily result in or from the democratization of the student body; universities could become more inclusive without becoming more open. But the pattern following the war suggests that beyond a certain threshold greater inclusiveness did imply greater openness. During the 1920s and early 1930s, a period of significant expansion, the overall rate increased more rapidly than the rate for the educated elite.

Disaggregating the first occupational category into its constituent groups reveals that the various rates were of the same order of magnitude. Over the period, however, the rates grew most rapidly or declined most slowly for the sons of clergymen, professors and secondary school teachers. Until the 1880s they were close to those for the other groups in the educated elite, but subsequently they tended to be higher, in part because they were less affected by the general downturn of the 1890s. The resulting pattern is at odds with the status hierarchy as conventionally defined: the children of graduates of the lower status faculties (protestant theology, philosophy, and the natural sciences) were more likely to attend universities than those of graduates of the Faculties of Law and Medicine. But the disparity would be less pronounced and might even vanish if all institutions of higher education were taken into account.

7. Riese, 43.

Thus evidence for Baden for the period before World War I and from Württemberg in 1933 suggests that the children of government bureaucrats were much more likely to attend *Technische Hochschulen, Handelshochschulen* and other specialized institutions than were the children of teachers and clergymen. This was particularly true in the periods such as the 1890s when total attendance at the universities was relatively low (Table 2).

A major cause of the relative decline in the rate for the educated elite was the rapidly growing demand for higher education among the children of industrialists, artisans and the owners of stores and other commercial firms. The latter trend probably began around the middle of the century, following a decade or two during which the rate for this occupational category had declined rapidly. In any event the trend was evident in Baden and Württemberg in the early 1870s, and it remained pronounced until the late 1920s. During the enrollment boom of the 1870s and 1880s the pace of growth far surpassed the more general pace. In the 1890s the downturn was less pronounced. In the decade before the war the rate again grew more rapidly than the overall rate. A comparison of the index of selectivity for Prussia in 1911 and for Germany in 1928 suggests the trend may have been reversed in the years immediately following the war, but around 1930 the demand for higher education in these occupational groups was again rising relative to that in the population generally.

Contributing to this growth in demand was the steady increase in the average size of industrial and commercial firms. The owners of large firms were always more likely to send their children to universities than were artisans and small shopkeepers, and the former group grew rapidly in size as the period progressed. Yet when the two groups are separated, the indices of selectivity reveal that through most of the period it was among the children of artisans and small shopkeepers that the demand for higher education increased most rapidly. In Württemberg the incidence for the old middle class almost tripled between 1873 and 1908, from .64 to 1.72, while that for the industrial and commercial bourgeoisie increased only from 7.88 to 8.12. The data for Prussia and Baden do not permit distinguishing between the children of small shopkeepers and the commercial bourgeoisie, but the data for students from the manufacturing sector reveal trends similar to those observed in Württemberg. In Baden between 1873 and 1893 the rate for the sons of artisans grew more rapidly than both the overall rate and that for the sons of industrialists (which failed to keep pace with the overall rate), and this was also the case in Prussia between 1902 (the first year for which the relevant data were reported) and the war. For the 1920s the evidence is fragmentary and somewhat contradictory. A comparison of the data for Prussia in 1911 and for Germany in 1928 suggests that prewar trends may have continued, but comparisons of the data for Württemberg in 1909 and 1933 and for Germany in 1928 and 1931 point to the opposite conclusion. One possibility is that the rate for the old middle class continued to rise more rapidly than that for the entrepreneurial class through the early and mid-1920s, but that around 1930 the trend was reversed, perhaps for reasons relating to the depression.

The patterns differ somewhat if the focus is on higher education generally rather than on the universities. In Baden between the 1870s and the war the propensity for students from the industrial and commercial sectors to enroll at a *Technische Hochschule* rather than at a university was usually greater than it was for those of different backgrounds, and it was usually greater for those from the industrial bougeoisie than

Table 2: Rates of Enrollment in Higher Education: The Educated and Governing Elite

Prussia:
Universities (Male)

	1887	1893	1902	1911
Bureaucrats and Lawyers	26.03	18.23	18.10	22.08
Teachers	33.77	33.62	41.79	46.67
Clergymen	32.33	28.29	31.07	44.04
Medical Personnel	33.24	27.30	24.89	35.78
Military Officers	22.59	18.06	20.86	20.91
Total	29.74	24.31	25.28	31.52
N	3264.50	2916.80	3732.00	4709.00

Württemberg:
Universities (Male)

	1873	1879	1885	1891	1897	1903	1909	1933
Bureaucrats and Lawyers	12.75	19.71	17.95	16.70	14.75	15.89	22.98	29.27
Teachers	38.55	31.04	29.86	33.06	34.42	33.52	31.70	54.11
Clergymen	34.20	45.20	45.57	49.62	46.45	48.80	69.18	51.70
Medical Personnel	30.65	29.67	25.92	22.23	20.87	21.93	26.32	33.91
Military Officers	13.37	14.96	16.03	1.43	8.07	4.80	21.30	26.95
Total	23.06	28.06	26.40	25.17	23.73	24.48	32.30	35.61
N	220.00	286.00	284.00	290.00	316.00	323.00	384.00	792.20

Baden:
Universities (Male)

	1873	1878	1883	1888	1893
Bureaucrats and Lawyers	28.21	22.87	28.78	33.81	30.32
Teachers	39.66	28.48	25.63	22.22	26.10
Clergymen	26.95	18.36	32.49	43.50	33.75
Medical Personnel	43.86	30.74	34.95	56.58	37.22
Military Officers	8.82	20.78	19.95	26.72	13.25
Total	30.38	23.95	29.35	36.70	29.76
N	144.80	134.40	180.00	247.20	225.60

Table 2 (continued)

Baden:
Technische Hochschule (Male)

	1873	1878	1883	1888	1893
Bureaucrats and Lawyers	26.07	19.93	8.06	13.58	20.77
Teachers	17.24	13.62	6.41	7.66	8.48
Clergymen	12.08	7.87	5.69	6.21	8.62
Medical Personnel	11.44	13.66	5.32	12.18	11.10
Military Officers	17.63	18.70	3.63	8.91	8.43
Total	19.47	16.11	6.65	11.05	14.35
N	92.80	90.40	40.80	74.40	108.80

Germany: Higher Education of the Educated and Governing Elite

	Male		Female	
	1928	1931	1928	1931
Universities	51.62	43.92	16.85	20.24
Technische Hochschulen	8.49	8.90	.76	1.10
Other	3.53	2.69	.73	1.67
All	63.64	55.52	18.33	23.01
N	20048.90	18795.30	5785.10	7767.70

Note: "Bureaucrats" are high government officials; "Teachers" are professors and teachers with university degrees; "Medical Personnel" are doctors, dentists, pharmacists and veterinarians.

for the sons of artisans. But even when the *Technische Hochschulen* and the other specialized institutions are included in the calculations, the trends noted with reference to the universities persist. Over the period as a whole the demand for higher education grew more rapidly in the industrial and commercial sectors than it did in the population as a whole, and within these sectors it grew more rapidly in the old middle class than in the entrepreneurial class (Table 3).

Of the general occupational categories the one most responsible for the large growth in total enrollment in the period considered was the new middle class. In Württemberg, for instance, male students in this category—the sons of middle-ranking bureaucrats, school teachers, professionals without academic training and white-collar workers in private firms—accounted for 37.6% of the total growth in male enrollment between 1873 and 1933. (The actual numbers increased ninefold.) Between 1887 and 1912 the new middle class was responsible for 34.4% of the increase in the total number of Prussian students. (The numbers increased from 2,999 to 6,238.)

But these impressive gains resulted less from rising rates of university attendance than from the rapid growth in the numbers at risk. In fact, in all cases examined the rate for the new middle class failed to keep pace with the overall rate. Disaggregated, the indices of selectivity for the sons of free professionals (journalists, musicians, architects, etc.) and teachers tended to grow over time, while those for sons of middle-ranking bureaucrats and white-collar workers in private firms tended to fall. This had the effect of widening the disparities among these occupational groups. By the end of

Table 3: Rates of Enrollment in Higher Education: The Entrepreneurial Class and the Old Middle Class

Württemberg: Universities (Male)

	1873	1879	1885	1891	1897	1903	1909	1933
a.	2.24	6.36	8.46	5.90	4.17	4.80	4.65	
b.	32.21	23.36	47.40	23.44	22.98	14.95	21.33	
c.	.61	.79	1.13	.87	.77	1.02	1.44	
d.	.81	1.62	1.87	2.06	1.72	2.00	2.64	
a + b.	7.88	12.03	16.46	9.78	8.49	6.99	8.12	15.62
c + d.	.64	1.02	1.27	1.12	.98	1.24	1.72	3.35
a + c.	.64	1.08	1.51	1.21	1.05	1.41	1.83	
b + d.	1.55	2.89	4.32	3.57	3.54	3.25	4.64	
Total	.80	1.41	2.06	1.71	1.61	1.82	2.48	4.96
N	123.00	202.00	290.00	258.00	260.00	299.00	384.00	1112.40

Baden: Universities (Male)

	1873	1878	1883	1888	1893
a.	3.32	2.73	5.13	6.23	5.39
c.	.66	.49	.77	1.82	2.05
a + c.	.76	.60	1.05	2.18	2.38
b + d.	1.67	1.64	4.10	5.14	5.38
Total	.95	.84	1.80	2.97	3.23
N	105.60	92.00	201.80	348.80	412.80

Baden: Technische Hochschule (Male)

	1873	1878	1883	1888	1893
a.	7.15	7.60	5.13	3.17	4.69
c.	.57	.48	.11	.26	.36
a + c.	.80	.83	.44	.50	.79
b + d.	1.64	2.08	.87	.79	1.35
Total	.82	.87	.31	.41	.65
N	90.40	95.20	34.40	48.00	83.20

Prussia: Universities (Male)

	1887	1893	1902	1911
a.			5.97	6.88
c.			.86	1.02
a + c.	1.59	1.20	1.52	2.00
b + d.	4.14	3.51	4.34	5.33
Total	2.37	1.94	2.49	3.19
N	5051.30	4367.40	6241.60	8229.50

Table 3 (continued)

Germany: Higher Education	Male		Female	
	1928	1931	1928	1931
Universities				
a + b.	9.25	11.60	2.43	4.18
c + d.	3.63	3.21	.65	.86
Total	4.50	4.33	.93	1.30
N	21182.00	19551.40	4383.20	5843.40
Technische Hochschulen				
a + b.	3.70	4.91	.13	.26
c + d.	.65	.72	.01	.03
Total	1.12	1.28	.03	.06
N	5281.50	5766.20	152.60	284.00
Other				
a + b.	1.31	1.46	.09	.38
c + d.	.41	.56	.03	.10
Total	.55	.68	.04	.14
N	2601.00	3053.80	177.20	616.50
All				
a + b.	14.26	17.97	2.65	4.81
c + d.	4.69	4.49	.70	.99
Total	6.17	6.28	1.00	1.50
N	29064.50	28371.40	4713.00	6743.90

Note: a. industrialists
b. merchants, bankers
c. artisans
d. shopkeepers

the period the rates for free professionals and teachers were more than half that for the educated elite, while the rate for middle-ranking bureaucrats was much lower and that for white-collar workers in private firms was lower still (Table 4).

The next general category, the farming sector, contributed relatively few students, especially when the numbers at risk are taken into account. Although the rate of attendance grew over time, it started from a low base and always remained far below the overall rate. Around 1930 it was less than one-quarter that of the cohort generally. The rate for those whose fathers owned large estates was much higher, but they constituted only a small fraction of farmers' sons and hence had little effect on the overall pattern. The rates and indices of selectivity for the farming sector as a whole are not much higher than for the land-owning peasantry (Table 5).

Table 4: Rates of Enrollment in Higher Education: The New Middle Class

Württemberg: Universities (Male)

	1873	1879	1885	1891	1897	1903	1909	1933
e.	6.76	9.19	3.84	3.96	4.73	2.20	3.65	19.14
f.	9.13	15.78	18.18	14.77	13.10	14.90	24.36	19.20
g.	10.48	18.02	16.45	12.77	11.94	10.30	14.34	11.01
h.	3.05	5.63	4.82	3.03	3.41	2.80	2.66	5.41
Total	8.88	14.94	14.58	10.94	9.73	8.66	10.99	9.84
N	104.00	185.00	210.00	199.00	234.00	255.00	351.00	1242.10

Baden: Universities (Male)

	1873	1878	1883	1888	1893
e.	4.81	0	5.88	8.52	14.72
f.	15.68	8.50	16.68	25.69	26.15
g.	6.37	7.37	9.41	13.35	11.37
h.	4.10	3.07	3.27	4.81	4.36
Total	9.12	6.61	10.23	14.59	12.26
N	76.40	63.00	114.90	198.90	205.40

Baden: Technische Hochschule (Male)

	1873	1878	1883	1888	1893
e.	3.61	11.14	2.94	3.87	2.45
f.	10.26	4.52	.74	2.55	4.60
g.	6.37	7.02	3.95	4.50	6.87
h.	2.05	1.42	.67	.27	.15
Total	7.00	5.81	2.40	2.99	4.19
N	58.60	55.40	26.90	40.80	70.30

Prussia: Universities (Male)

	1887	1893	1902	1911
e.	3.29	3.09	4.04	4.25
f.	11.76	8.76	12.23	22.57
g.	9.97	6.94	8.36	9.00
h.	3.03	1.71	1.45	1.63
Total	7.59	5.14	5.59	6.50
N	2999.10	2509.60	4235.50	6238.30

Table 4 (continued)

Germany: Higher Education

	Male		Female	
	1928	1931	1928	1931
Universities				
e.	16.84	17.00	4.00	5.47
f + g.	12.04	9.77	2.46	3.08
h.	3.28	2.51	.54	.60
Total	8.02	6.52	1.59	1.97
N	27808.40	23279.80	5525.20	7017.60
Technische Hochschulen				
e.	6.10	7.75	.12	.27
f + g.	2.14	2.27	.10	.21
h.	.72	.75	.02	.04
Total	1.55	1.67	.06	.13
N	5370.40	5954.20	229.70	457.30
Other				
e.	1.57	1.86	.21	.69
f + g.	1.29	1.96	.18	.68
h.	.51	.64	.04	.16
Total	.93	1.34	.11	.44
N	3221.80	4776.10	395.20	1554.00
All				
e.	24.51	26.60	4.33	6.43
f + g.	15.48	14.00	2.75	3.96
h.	4.50	3.89	.60	.80
Total	10.50	9.52	1.77	2.53
N	35400.60	34010.10	6150.10	9028.90

Note: e. free professionals without university degrees
f. teachers without university degrees
g. middle-ranking government employees
h. white-collar workers in private firms

The final general occupational category, the working class, exhibited little demand for higher education, often even less than the peasantry. But, again, there was wide variation within the category. The rate for sons of rural laborers, where it can be determined, was much lower than that for the urban working class. And the rate for those employed by the government, for the most part postal or railroad workers, was always about 10 times that for the rest of the working class. Indeed it was frequently higher than the rates for artisans, shopkeepers and white-collar workers in private firms. These patterns go far to explain differences among the German states in the

Table 5: Rates of Enrollment in Higher Education: The Farming Sector and the Working Class

Württemberg: Universities (Male)	1873	1879	1885	1891	1897	1903	1909	1933
i.	.94	8.82	9.43	10.66	8.96	6.50	12.50	23.74
j.	.19	.34	.33	.23	.23	.27	.33	.33
i + j.	.19	.37	.36	.26	.25	.29	.36	.58
k.	1.30	2.87	2.35	2.14	1.98	1.37	2.45	4.22
l.								.14
m.								.03
l + m.	.06	.06	.16	.17	.09	.10	.09	.46
k + l + m.	.28	.57	.56	.54	.46	.34	.51	.83
N:l + j.	68.00	127.00	123.00	97.00	104.00	121.00	145.00	259.40
N:k + l + m.	16.00	35.00	40.00	48.00	50.00	45.00	77.00	228.60

Baden: Universities (Male)	1873	1878	1883	1888	1893
i.	.92	3.79	5.71	4.62	9.57
j.	.22	.19	.18	.34	.54
i + j.	.23	.20	.19	.35	.56
k.	1.74	1.52	1.62	2.77	2.87
l + k.	.05	.03	.01	.17	.06
k + l + m.	.35	.38	.63	.65	.57
N:l + j.	75.20	65.60	60.80	114.40	196.80
N:k + l + m.	19.60	23.30	44.70	53.10	56.20

Baden: Technische Hochschule (Male)	1873	1878	1883	1888	1893
i.	1.83	4.73	2.85	.93	.87
j.	.08	.09	.03	.02	.04
i + j.	.09	.10	.04	.03	.05
k.	.87	.70	.33	.16	.10
l + m.	0	0	.01	0	0
k + l + m.	.15	.13	.07	.03	0
N:l + j.	28.80	32.00	12.80	8.80	16.00
N:k + l + m.	8.60	7.80	5.10	2.40	.20

Table 5 (continued)

Prussia: Universities (Male)

	1887	1893	1903	1911
i.	2.06	1.62	2.36	3.05
j.	.43	.37	.47	.59
1 + j.	.50	.42	.54	.67
k.	1.50	1.16	1.15	1.70
1 + m.	.04	.03	.04	.06
K + 1 + m.	.19	.15	.16	.25
N:i + j.	2138.50	1614.30	2101.10	2587.60
N:k + 1 + m.	538.10	501.40	812.10	1668.10

Germany: Higher Education

	Male		Female	
	1928	1931	1928	1931
Universities				
i.	8.80	6.90	1.65	1.79
j.	.54	.53	.05	.07
i + j.	.69	.65	.08	.10
k.	1.85	2.44	.13	.29
l.		.28		.03
m.		.03		0
1 + m.	.19	.25	.01	.03
k + 1 + m.	.32	.43	.02	.05
N:i + j.	4526.00	4132.00	505.50	641.30
N:i + j + k.	3030.90	4180.70	186.90	494.90
Technische Hochschulen				
i.	1.55	1.19	.05	.07
j.	.05	.07	0	0
i + j.	.08	.09	0	0
k.	.29	.58	.01	.03
l.		.06		0
m.		.01		0
1 + m.	.02	.05	0	0
k + 1 + m.	.04	.10	0	0
N:l + j.	539.80	605.10	8.00	13.70
N: 1 + j + k.	394.50	926.30	12.80	45.00
Other				
i.	2.34	1.66	.09	.28
j.	.14	.24	0	.01
i + j.	.18	.27	0	.02
k.	.35	.66	.01	.10
l.		.12		.01
m.		.02		.01
1 + m.	.04	.11	0	.01
k + 1 + m.	.06	.15	0	.02
N:i + j.	1200.80	1706.30	26.60	101.70
N:k + 1 + m.	578.70	1474.90	16.50	197.60

Table 5 (continued)

Germany: Higher Education (continued)

	Male		Female	
	1928	1931	1928	1931
All				
i.	12.69	9.75	1.79	2.13
j.	.74	.84	.05	.08
i + j.	.95	1.01	.08	.12
k.	2.49	3.68	.15	.42
l.		.46		.05
m.		.06		.01
l + m.	.25	.40	.01	.04
k + l + m.	.42	.68	.02	.08
N:i + j.	6266.60	6443.40	540.10	756.70
N:k + l + m.	4004.10	6581.90	216.20	737.50

Note: i. owners of landed estates (Gutsbesitzer)
j. land-owning peasants
k. workers employed by the government
l. non-agricultural workers in private firms
m. agricultural workers

overall enrollment rate for the working class. Where there were few rural laborers in the relevant age cohort and a sizeable proportion of the working class employed by the government, as in Baden and Württemberg, the rate was higher than where larger proportions worked in agriculture, mining and factories, as in Prussia (See Table 5).

Obviously there was wide variation among occupational groups both in the level of demand for higher education and in the rate at which the level changed over time. But what was the net result? Were the German universities becoming less or more selective with time? To aid in answering these questions indices of dissimilarity have been calculated for each of the states and periods considered. The index of dissimilarity can be defined as the proportion of the "selected" population that would have to be from different categories if the distribution among the categories was to match that of the population at risk. An index of 0 means that the "selected" population is completely representative, and an index of 99 means that it is almost completely unrepresentative. (It could not be totally unrepresentative.) Comparisons among indices of dissimilarity are legitimate only when the number and specification of the categories remain constant, but this condition has been met.

When calculated for the total male population at risk, the indices of dissimilarity reveal little variation either among the German states or over time. For each of the

states university education was about equally selective, and the passage of time brought few changes. There may have been a tendency for the universities to become less selective after the war, but if this was the case the trend was not pronounced.

Of course, the results are strongly affected by two sizeable groups that never exhibited much demand for higher education, the peasantry and the working class. If the analysis is restricted to the other occupational groups—usually about 30% of the population at risk— it is clear that between unification and the Nazi seizure of power the German universities became much more representative. Apparently the general trend was only interrupted once, during the decade or so immediately preceding World War I (Table 6). These findings are consistent with the pattern revealed by the selectivity indices considered above: among the occupational groups exhibiting a moderate to high demand for higher education the greatest gains were made by groups in which the demand, at least initially, was relatively modest. To the extent these gains also outpaced those of the peasantry and the working class they tended to raise the overall indices of dissimilarity, but in this case the impression left by overall indices is misleading. Although those from the peasantry and the working class may not have gained much in the period considered, the German universities were certainly becoming less selective.

The Causes of the Transformation:

What caused the changing social composition of the German university? No attempt will be made here to answer the question conclusively. Rather, the intention is to review the major arguments that have been advanced and to offer some new hypotheses. Emphasis is, as in most earlier discussions of the subject, on the relationship between changes in the German economy and the transformation of German higher education.

Attempts to explain the social transformation of German higher education have tended to focus on five general approaches. These approaches are not mutually inconsistent, but their proponents have disagreed over their relative importance. In part this is because they have also disagreed over what it is that requires explanation: for some it is the tendency for German higher education to become more open over time, and for others it is the slow pace of change.

The first approach focuses on the relationship between the social demand for higher education and the expansion of job opportunities for the highly educated. It rests on a recognition that industrialization and the related social changes increased the demand for engineers, scientists, civil servants and members of the free professions. This demand raised the returns to investment in higher education, resulting in expanding enrollments. Most who discuss the subject are concerned with explaining the expansion of higher education, and stop here.[8] But a few go on to argue logically enough that expansion that outstrips population growth has implications for selectivity. With expansion higher education tends to become less selective due to ceiling effects; as there is a limit to the ability of elite social groups to satisfy the rising "de-

8. J. Conrad, *Das Universitätsstudium in Deutschland während der letzten 50 Jahre* (Jena, 1884), 21-23; Conze, 676.

Table 6: Indices of Dissimilarity*

Württemberg: Universities (Male unless noted)	1873	1879	1885	1891	1897	1903	1909	Male 1933	Female 1933
All Occupations	63.04	62.05	61.73	62.99	64.84	59.82	60.80	53.63	71.01
All Except Peasantry and Working Class	64.25	61.93	58.65	57.56	56.90	52.38	48.88	36.49	51.19

Baden: Universities (Male)	1873	1878	1883	1888	1893
All Occupations	63.01	63.46	7.38	59.97	54.88
All Except Peasantry and Working Class	66.11	64.04	60.64	52.78	43.25

Baden: Technische Hochschule (Male)	1873	1878	1883	1888	1893
All Occupations	66.28	66.85	76.59	77.03	75.38
All Except Peasantry and Working Class	62.73	61.71	70.45	65.39	62.34

Prussia: Universities (Male)	1887	1893	1902	1911
All Occupations	57.57	55.57	55.79	56.77
All Except Peasantry and Working Class	52.62	49.46	45.54	49.05

Germany: Higher Education	Male		Female	
	1928	1931	1928	1931
Universities				
All Occupations	56.20	54.81	63.06	62.76
All Except Peasantry and Working Class	35.78	37.71	42.77	43.85
Technische Hochschulen				
All Occupations	59.85	56.59	70.38	67.42
All Except Peasantry and Working Class	38.10	38.62	49.81	48.96
Other				
All Occupations	47.94	41.53	64.80	59.47
All Except Peasantry and Working Class	30.97	29.59	44.41	41.82
All				
All Occupations	56.01	52.94	63.39	62.35
All Except Peasantry and Working Class	35.75	35.97	43.10	43.86

*Based on the assumption that the ratios between the rates for merchants and shopkeepers in Baden and Prussia, between the rates for middle-ranking civil servants and working-class government employees in Baden and Prussia, and between the rates for industrialists and artisans in Prussia in 1887 and 1893 were the same as in the relevant years in Württemberg. This assumption permits the same occupational categories to be used for each state, a prerequisite if the indices are to be compared across states as well as across time.

mand" for students, opportunities are opened for those lower in the social order.[9] This is an inherently appealing argument, but for the period under consideration it should be used with caution. Prior to World War I even the social groups exhibiting the greatest demand for higher education rarely enrolled more than half their sons in higher education. Of course there may have been a rather low de facto ceiling resulting from screening at the secondary level and other factors, but if this was the case it rose considerably just before the war and during the 1920s. One possibility is that it was only in these years that families in the educated elite came to consider it imperative that their sons receive a higher education. In any event, growth in the number from this stratum in the decade before the war permitted total enrollment to increase rapidly without becoming less selective. It was only after the war, when the rate for the educated elite grew less rapidly than the overall rate, that ceiling effects seem to have become a factor.

The second approach emphasizes the growth in per capita income that accompanies industrialization. The reasoning is straightforward. Beyond that resulting from population growth, expansion in enrollment presupposes a growth in personal income. As the economy expands, more and more will be able to afford higher education, and, for a combination of consumption and investment reasons, more and more will enroll. A corollary is that social groups that are rising in status and per capita income will exhibit a rising demand for higher education.[10]

Another approach focuses on the relationship between fluctuations in enrollment and fluctuations in the trade cycle and/or the job market. One version, perhaps best represented by Johannes Conrad and Franz Eulenburg, emphasizes the negative correlation between the business cycle and the enrollment trend. When the economy was growing rapidly, as in the third quarter of the 19th century and the late 1890s, enrollments were relatively low, and in times of depression such as the 1880s they were high. These fluctuations in enrollment affect selectivity, with the proportions from modest backgrounds increasing when the number of students increases, and vice versa. Actually this reverses the logic of the argument, which suggests that economic depression encouraged those of modest origins to invest in more education, thus increasing enrollments and reducing selectivity.[11] Ludwig Cron has argued precisely the reverse, insisting that there tends to be a positive relationship between the business cycle and enrollment since relative prosperity permits more to invest in higher education.[12] Others exemplifying this approach focus not on the trade cycle generally but rather on fluctuations in perceived job opportunities for the highly educated. In their opinion enrollments stagnated or declined when the supply of university grad-

9. Jarausch, 626; Mitgau, 251-52.
10. J. Conrad, "Einige Ergebnisse der deutschen Universitätsstatistik," *Jahrbücher für Nationalökonomie und Statistik*, 87 (1906), 449-50; Eulenburg, 66; Kaelble, "Chancenungleichheit," 131-32, 136; Mitgau, 244; Riese, 49.
11. Conrad, *Das Universitätsstudium*, 21-23; Franz Eulenburg, *Die Frequenz der deutschen Universitäten von ihrer Gründung bis zur Gegenwart* (Leipzig, 1904), 256; Prahl, 312; Ringer, 84, 99.
12. Cron, 31, 38-39, 59; Riese, 49-50.

uates in the job market exceeded the demand. Fluctuations in the perceived availability of jobs not requiring a higher education are deemed irrelevant.[13]

The fourth approach emphasizes cultural rather than economic factors. Its proponents attribute much of the expansion in enrollment to the prestige enjoyed by higher education and by the highly educated. It was not the prospect of better jobs that attracted more and more to the universities, but rather the special status conferred by university attendance and the related credentials. Some go on to suggest that many of the students, particularly those of modest origins, were not rational actors in the economic sense; they failed to understand the realities of the economic and social order.[14] Others imply that such individuals were acting rationally to the extent that they intentionally sacrificed their economic interests narrowly defined in order to enhance their status.[15] That enhancing their status actually furthered their economic interests is not argued, of course, since to do so would be to question the independent importance of non-economic motives.

The fifth approach concentrates on governmental policies affecting the availability and cost of education. Arguments reflecting this approach have been advanced both by those who think German higher education did become more open over time and by those who disagreed. The former highlight a variety of policies allegedly directed, at least objectively, at curbing or redirecting the rising social demand for higher education.[16] The latter focus on the consequences of educational policies designed to promote economic growth, political socialization or equity.[17] In both cases it is assumed that governments could and did do much to regulate enrollment rates through a combination of constraints and incentives.

Aspects of all these approaches can be found in the recent literature, but the tendency has been to put the emphasis on the non-economic factors. This is particularly true of those who argue that between the mid-19th century and the 1930s German higher education did not become more open. While recognizing that economic growth contributed to a large expansion in enrollments, they argue that the effects on the social origins of students and hence on recruitment to elite occupations were insignificant.[18]

Those claiming that access to German higher education was actually becoming more open have also tended to stress cultural and institutional rather than economic factors. Particular attention has been given to the impact of the high status associated with university attendance and of governmental policies aimed at furthering mobility and equity. Again, the consequences of economic growth for selectivity are judged

13. Eulenburg, *Die Frequenz,* 256; Jarausch, 613, 629; Kaelble, "Chancenungleichheit," 134–36; Riese, 53.
14. Riese, 55.
15. Conrad, *Das Universitätsstudium,* 21–23; Conrad, "Einige Ergebnisse," 784–85, 792; Eulenburg, *Die Entwicklung der Universität Leipzig,* 66; Mitgau, 244.
16. Kaelble, "Chancenungleichheit," 136–48; Prahl, 283, 290–91; Riese, 48, 53–58.
17. Conrad, "Einige Ergebnisse," 440–41; Jarausch, 616–17; Kaelble, "Chancenungleichheit," 139–41.
18. Conze, 676; Kaelble, "Sozialer Aufstieg," 68–70; Kaelble, "Chancenungleichheit," 127–31, 148–49; Ringer, 97–99, 108–10; Zorn, 328–29.

insignificant.[19] Yet behind these arguments lies a limited view of how economic changes could have affected enrollment patterns. Let me elaborate.

Rapid industrialization inevitably transforms the preindustrial occupational order and status hierarchy. On the one hand it provides new opportunities for upward mobility and increased consumption. On the other it threatens many of those tied to traditional occupations and social roles with economic dislocation and downward social mobility. This is all obvious enough, but the implications for educational expansion and selectivity are not. To the extent scholars have considered the links between the demand for higher education in Germany and contemporary changes in the social order, they usually have focused on upwardly mobile groups such as the entrepreneurial class. The assumption apparently has been that if economic growth causes any groups to manifest a growing demand for higher education it should be the groups gaining in status and relative income. Yet if one considers the likely consequences of *not* seeking a higher education there seems reason to give at least as much attention to those victimized by economic growth. The logic is straightforward. To the extent those facing economic dislocation and/or downward mobility are conscious of their marginal relationship to the economic and social order they can be expected to try to correct the situation. But since their marginality results from structural processes over which they have no control, correcting the situation is likely to require innovative behavior. Among the many that may exist, an obvious possibility is to invest heavily in education in the hope of entering a more promising career. This suggests that with economic growth the occupational groups that are facing real or relative deprivation will manifest a growing demand for higher education.

Did they? The evidence suggests that they did. Of the occupational groups considered here, at least four can be said to have suffered real or relative deprivation as a result of economic growth and the attendant changes in the social order: the artisans, shopkeepers, owners of landed estates, and peasants. In each of the states examined the rate of university attendance for these groups increased over time, in most cases much more rapidly than the overall rate. Consider the trends in Württemberg, the state for which the evidence is most abundant. Between 1873 and 1933 the rate for the marginal occupational groups increased two-and-a-half times as rapidly as that for the remaining groups. If the analysis is restricted to the occupations below the university-trained professionals and high government officials and above the peasantry and the working class (the occupations most responsible for the growth of German higher education in these years) the disparity is even more striking; the rate for the marginal groups increased more than five times as rapidly as that for the remaining groups. In both cases, it should be added, the rates for the marginal groups were still smaller at the end of the period, meaning that the relatively rapid growth for these groups made higher education more open.

The implications with respect to selectivity seem clear. To the extent German higher education was becoming more open between the mid-19th century and the 1930s the marginal occupational groups were largely responsible. Yet economic changes were largely responsible for the marginality of these groups and hence for their rising demand for higher education. This suggests that there was a direct and

19. Jarausch, 616–20, 626; Riese, 48.

strong causal relationship between the economic transformation of Germany and the social transformation of the German university.

But this is only a hypothesis. Skeptics could easily argue that the rising demand for higher education among the sons of artisans, shopkeepers and farmers came primarily from the segments of these groups that prospered from industrialization, not from those put on the defensive. The evidence does not permit rejecting either possibility. Nor does it justify abandoning the more conventional hypotheses. What is needed, it seems, is a flexible and multifaceted approach, one leaving room both for the conventional hypotheses and for that outlined above. One possibility would be to think in terms of an economic model in which values are assigned to the psychic as well as the monetary benefits and costs of pursuing a higher education. Such a model would permit us to integrate the approaches emphasizing economic considerations with those stressing cultural or institutional factors, and it would have the additional advantage of forcing us to think in terms of alternatives. In particular, it would require us to give attention to the psychic and monetary costs and benefits of *not* pursuing a higher education.

Daniel R. Brower

Social Stratification in Russian Higher Education

Higher education came to the Russian Empire as a privilege. From its beginnings in the 18th century it conferred special rights to graduates; soon thereafter, the state set out to restrict university admissions to youth largely of upper-class, privileged background. As the numbers of students grew and the importance of educational qualifications increased among the country's bureaucratic and professional elite, higher education became ever more closely bound to the dramatic social changes occurring in Russia. By the early 20th century it reflected in its internal evolution certain of the conflicts leading the country to revolution. In this it was not unique among European nations; a half-century before, students in Western institutions of higher education had a direct part in the revolutionary movement. Nowhere else, however, were conditions as acute as in the Russian Empire. The revolution of 1917 brought to a violent end the old social order. It had a profound impact on the country's educational system. Yet ironically a form of privilege re-emerged as the new Soviet state sought to manipulate admissions to higher education to further its program of social revolution.

This theme of education as privilege provides the central focus of the discussion in the following pages on social stratification in Russian higher education. The pattern of class representation among the students depended in part on specific policies applied by the state and educational authorities. It also was influenced by the aspirations of segments of the Russian population to obtain access to higher learning as a path of upward—or horizontal—mobility, a means of protecting a jeopardized social position or of rising to higher status. By assessing the relative weight of government policy and social aspirations we can hope to reach an understanding of the forces which determined the changes in social recruitment from slow growth to sudden expansion between the mid-19th and early 20th centuries.[1]

1. Enrollment figures can be found in Vera Romanovna Leikina-Svirskaia, *Intelligentsiia v Rossii vo vtoroi polovine XIX veke* (Moscow, 1971), 55-56; William Johnson, *Russia's Educational Heritage* (N.Y., 1969), tables 32 and 33, 287-89; Nicholas Hans, *History of Russian Educational Policy* (N.Y., 1964), table 13, 421.

Our indicator of social stratification in tsarist Russia is the legal system of estates then in effect. Its social categories for grouping the population provide the sole evidence of student origins in school records. Unfortunately they bore only a remote connection to the real occupation and actual social standing of the families. Lacking more reliable data, we must use their crude labels. The estate most nearly approaching the designation of "elite" was that of nobility, usually grouped in the records with state bureaucracy. Originally the nobility had constituted the service pool for administrative and military needs of the tsarist state, and had received in exchange the exclusive right to landed estates and serfs. On the eve of the serf emancipation in 1861, only one-fourth held land providing substantial wealth, and probably one-half needed supplementary income to support their families. Emancipation of the serfs meant for many nobles financial ruin and emigration to the cities, where often they sought administrative service for themselves and higher education for their sons as principal means to avoid becoming *declassé* in fact if not legally.

Despite this process of partial melding of landed nobility and bureaucracy, the latter slowly emerged as a distinct and powerful group in Russian society. Non-nobles could enter state and local bureaucracy, and might hope to achieve the title of hereditary nobility if they advanced to high rank. Yet the majority of the bureaucracy remained dependent upon their service for livelihood, avoiding the purchase of estates even when noble by legal title. The boundaries between the landed nobility and bureaucracy were vague, but occupational patterns and property holdings were sufficiently distinct to justify calling the bureaucracy the new elite of the Empire.

Among the urban population, only the estates of merchantry and "honorary citizenry" could claim some of the honor attached to the nobility. The merchant estate came by the end of the 19th century to include many temporary "merchants" who had paid the required legal fees solely to have the right to engage in large-scale commerce and industry. The honorary citizens constituted an assorted group of urban professionals whom the state sought to honor—and encourage—by a special mark of social status. In effect, the two estates represented an upper middle class, mingling more traditional and new occupations.

Occupying a special category in Russian society was the priesthood, until the 1860s a closed estate socially isolated by legal restrictions. Guardians of the spiritual well-being and political loyalty of their flock, the parish priests struggled on miserable incomes to raise large families. Freedom granted in the 1860s to pursue new occupations and to enter other estates brought an influx of priests' sons into higher education. The priesthood, like the merchantry and nobility, was very small. The national census of 1897 revealed that these three estates each represented approximately one percent of the Empire's population.

Most closely resembling a lower middle class was the estate designated as "petty bourgeoisie *(meshchanstvo)*," usually grouped with the urban artisans. Both titles could be acquired by special legal procedures, but were usually passed on from parents to offspring with no requirement as to means of livelihood. The occupations practiced by those belonging to these estates filled a large range of urban trades and professions, including by the end of the 19th century a number of white-collar posi-

tions as well as some skilled trades and petty commerce. The petty bourgeoisie constituted about 10 percent of the inhabitants of Russia at that time.

The single largest estate of the land was the peasantry. The category had designated until the mid-19th century the serf population, working the land as the chattel of landowners or of the state. The abolition of serfdom granted them legal personality but left in effect many of the constraints which kept them formally bound to their village and estate of birth. The economic growth of the urban areas of the country transformed millions of these legally classified "peasants" into urban migrants, working often as laborers in factories, day laborers, and some as small-scale entrepreneurs, middlemen and tradesmen. Among the peasants working as farmers, a few succeeded in turning their agricultural activities into a source of substantial wealth. It is fair to assume that those rare peasant offspring who appeared among Russia's students were from the urbanized peasants or the relatively well-to-do farmers, lower class only relative to noble or merchant. The poverty and lack of educational opportunity of most Russian peasants effectively deprived their children of formal education, save perhaps a year or two of grammar school, until the very end of the tsarist regime.

The presence of these various social groups among the country's student population is revealed—imperfectly and incompletely—in the governmental statistics on enrollment in higher education. The Ministry of Education kept the most complete records, but these apply only to the universities. The technical schools were under the jurisdiction of a wide variety of agencies, whose methods of tabulation were uncoordinated and frequently nonexistent. Thus we must look for clues indicating the general trend in figures on enrollment which are in fact only a partial listing. The changing pattern of university enrollments, for which alone we can construct a continuous series, is displayed in Table 1. The most notable change was the gradual decline in the percentage of the nobility/bureaucracy, falling from 67 percent to 35 percent.

These figures hide a much more dramatic fall in the proportion of hereditary nobles. In 1914, they constituted only eight percent of the total; 30 years before, in 1880, their share of the student population was 23 percent. In absolute numbers, they were slightly more numerous in 1914 than in 1880, but the expanding enrollments were engulfing the old elite. The mid-19th century was their moment of predominance—almost 60 percent of the students at St. Petersburg University were nobles;[2] 20 years later, they represented only 23 percent.[3] On the other hand, the proportion of sons of bureaucrats remained relatively constant, keeping pace with the rising enrollments. It rose slightly from 19 percent to 24 percent at St. Petersburg University between 1859 and 1880; overall, it rose from 23 percent in 1880 to 27 percent in 1914. The bureaucracy had established itself as a substantial beneficiary of higher education.

The other significant trend is the increase in proportion of sons of the petty bourgeoisie. If those of the peasantry are added to their numbers, the Russian universities by 1914 included among their students over one-third from the lower and lower-mid-

2. Tsentral'nyi gosudarstvennyi istoricheskii arkhiv v Leningrade [abbrev. TsGIAL], *fond* (f.) 773, *opis* (o.) 95, *delo* (d.) 172 ("St. Petersburg University Report for 1859"), *listy* (11.) 333–34.

3. Leikina-Svirskaia, 62.

Table 1: University Students: Social Composition by Estates, 1865–1914

	(Percent Distribution)					
Estate	1865	1880	1895	1900	1907	1914
Nobility/Bureaucracy	67	47	46	52	45	35
Priesthood	9	23	5	8	11	10
Merchantry/Honorary citizenry	3	8	7	12	12	11
Petty Bourgeoisie	5	11	32	20	22	23
Peasantry	13	3	6	5	6	13
Other	4	8	4	3	4	6

Sources: A. Rashin, "Gramotnost' i narodnoe obrazovanie v Rossii," Istoricheskie zapiski, v. 37 (1951), 78; V. R. Leikina-Svirskaia, Intelligentsiia v Rossii (Moscow, 1971), 62-64.

dle classes. The displacement of the nobility and gradual rise of these new classes suggests a gradual process of "democratization" in the social composition of Russia's student population. This generalization appears appropriate as well when the meager figures on the social origins of students in technical schools are examined. In the early 1870s, the nobility/bureaucracy dominated these schools almost to the same extent as the universities (55 percent of the students in six technical schools).[4] By 1914, their proportion had declined to 25 percent (the relative share of bureaucracy and nobility is impossible to determine); that of the petty bourgeoisie and peasantry had risen from 35 percent to 54 percent.[5] The long-term trends in the two groups of advanced schools thus coincided.

It is very difficult to read into the statistics on estates the actual social background and condition of the students. Thanks to a student-organized survey in one of the country's leading technical schools, we have a detailed profile of one important segment of the student population in the last years of the tsarist regime. The St. Petersburg Technological Institute was surveyed by a student group to elicit information on the political attitudes, social background, and financial condition of the students in order to draw a political portrait of the "typical" Institute youth. The 2,000 students tended to resemble their cousins across the river in the university by the relatively strong representation of the noble-bureaucrat group, 38 percent of the total (according to figures for 1913). However, like the other technical schools, the petty bourgeoi-

4. TsGIAL, f. 908, o. 1, d. 125, l. 88.
5. Hans, Table 34, 290 (figures drawn from enrollment in five technical institutes).

Table 2: Selectivity Index: All Russian Students 1914

Estate	Population of Russian Empire, 1897 (percent)	Russian Students 1914 (estimated)	Selectivity Index (Student/Population Ratio)
Nobility/Bureaucracy	1.4	30.3	21.6
Merchantry/Honorary Citizens	0.5	12.5	25
Priesthood	0.5	6.4	12.8
Petty Bourgeoisie	10.6	28	2.6
Peasantry and Cossacks	79.4	18.5	0.2

Note and Sources: The census of 1897 is the only reliable source on estate distribution for the late tsarist period; the estimated student population is James McClelland, "Higher Education in Soviet Russia, 1921-28," Past and Present, 80 (August 1978), Table 5, 137. Census figures appear in Obshchii svod po Imperii (St. Petersburg, 1905), 1:160-63.

sie provided a large number of students, 30 percent, and the peasantry another 13 percent, while merchantry and honorary citizens constituted 14 percent.[6] The questionnaires sent to all the students were returned by only one-half, but the social break-down of this group corresponded very closely to the total student body. As in earlier times, the majority of the students lived on incomes which bordered on poverty; 60 percent revealed that their monthly expenses were below the level considered sufficient for satisfactory housing and food. About five percent reported that they could not count on a daily main meal. Only 20 percent had incomes which allowed them to live comfortably. Although this group probably came largely from families of merchants and nobles, among the privileged estate of the empire were many families living on small incomes, often obliged to work at salaried positions to make ends meet. Only half of the students could count on their families to provide them with full financial support.[7] In other words, for one-half of the parents the entry of their sons in the Institute represented the hope of real social and economic advancement in Russian society.

These findings from the institute suggest that one must use with great caution the indicators of social inequality for Russian higher education. The only quantitative method measuring inequality suitable to the available data on stratification, with all their imperfections, is the index of selectivity. Table 2 presents the results of calcula-

6. *Teknologicheskii institut: sto let (1828-1928)* (Leningrad, 1929), 1:38.
7. M. V. Bernatskii (ed.), *K. kharakteristike sovremennogo studenta* (St. Petersburg, 1911), 20-21, 47, 59.

tions for all students in 1914. It reveals, as could be expected, that the nobility and merchantry were the most over-represented, peasantry the most under-represented among the students. The soundest conclusion to be drawn from these figures is that higher education continued to cater to the *legally* privileged, though the actual social standing of these students from the nobility/bureaucracy or merchantry frequently differed little from their unprivileged classmates. What factors explain their tenacious hold over advanced learning? What contrary forces were behind the gradual, belated rise of the "middle classes" among Russia's students?

The Causes of the Social Transformation:

The answers to these questions may be found in the changing patterns of official policy toward social recruitment into higher education and of popular attitudes among Russia's social classes toward the desirability and accessibility of that peculiar form of training for adult life. Government attitudes oscillated between restrictive and expansionist practices, reflecting the contradictory concerns of increasing the trained elite of the country and of assuring the political reliability of educated Russians. At the beginning of the 19th century, Alexander I had indicated a desire that advanced learning, then still in its infancy, be open to all Russians of talent (except, of course, serfs). The fear of revolution prompted his successor, Nicholas I, to alter this policy. His minister of education, Sergei Uvarov, declared in 1835 that a proper system of public education should "offer opportunities to each one to receive that education which would correspond to his mode of life and to his future calling in society."[8] Ten years later, he stated clearly his wish that the elitist education provided by the secondary schools (gymnasia) and universities be reserved for "noble and bureaucrat children, while the middle estates will turn to the district schools."[9] This static view of education corresponded to a static view of society, in which social position counted for more than merit and access to higher education remained a privilege of birth. In this manner the virus of social discontent and political radicalism was to be kept from penetrating Russian society.

Ironically, in those years the state had to cajole and entice the landed nobility to send their offspring to civilian schools. Alexander I for a time barred entry to the bureaucracy to anyone without some secondary training; Nicholas I opened special secondary schools providing virtually free room and board exclusively to the nobility. Gradually the realization spread among the provincial landed nobility that their offspring might find profit and prestige in advanced schooling. In the sarcastic words of the novelist Goncharov, these petty nobles became aware "that people could not make their way in life—that is acquire rank, orders of merit, and money except through education," which to them constituted "something called a diploma" acquired by "not merely a knowledge of reading and writing but of other hitherto unheard-of subjects."[10] By the 1840s, this policy appeared successful. The gymnasia

8. Quoted in Nicholas Riasanovsky, *Nicholas I and Official Nationality in Russia* (Los Angeles, 1959), 141.
9. Quoted in Allen Sinel, *The Classroom and the Chancellery* (Cambridge, Mass., 1973), 18.
10. Ivan Goncharov, *Oblomov,* trans. N. Duddington (New York, 1960), 135.

were filled predominantly with sons of nobles and bureaucrats, who made up overall 80 percent of the enrollment.[11] In those years two special advanced secondary schools catering to the nobility came into prominence, the Alexandrovsky (originally Tsarskoselskii) *Lyceum* and the School of Jurisprudence. Both prepared a carefully chosen group of noble youth for high government service and successfully carried out Nicholas' ideal of incorporating advanced education into a rigid estate hierarchy.[12] Though the universities never achieved such social "purity," the state's preferential policies, combined with rising interest in education among the nobles and the absence of both widespread opportunity and incentive on the part of the middle classes, produced a social hierarchy in the universities much as Nicholas had desired.

The educational policies of Alexander II opened higher education to other strata of the population. Following Russia's defeat in the Crimean War, the leaders of the empire suddenly perceived that more and better advanced learning was a national priority. The new minister of education preached the message that "learning is an urgent need."[13] University enrollments suddenly doubled. Technical schools, previously providing inferior vocational training, were elevated to the status of advanced institutes conferring social distinction on their graduates. The problem of socially undesirable elements among the student body soon reemerged following the attempted assassination of the tsar in 1866 by a part-time student. Clear criteria were needed to separate the chaff from the grain. The new minister of education, Dimitrii Tolstoi, found these in controls on numbers admitted and in rigorous studies, arguing in 1875 that advanced learning was for an aristocracy "of intellect, knowledge, and hard work."[14] Tolstoi's view reflected in part an elitist conception of higher education as the crucible in which the talented from all classes became infused with the spirit of enlightened reason *(Bildung);* it also justified the indispensable increase in student enrollment.

The enticement of new occupational opportunities and the widespread recognition of the distinction of learning combined to create a rush of students from the middle as well as upper privileged classes. The St. Petersburg Technological Institute, founded in 1833, had barely survived in its first two decades in the midst of noble disdain and real hostility toward professionalization among the merchants and industrialists of the country. Similarly, the Medical-Surgical Academy in St. Petersburg, offering the best medical training in the country, managed in those years to fill its student ranks only by recruiting a large number of priests' sons trained in secondary religious schools and malleable enough to accept an alternate career as military doctor. Both schools benefited by Alexander II's reforms, becoming large, advanced institutions of specialized learning and acquiring the reputation of centers of "real"—i.e., scientific—learning. No longer shunned by the upper classes, the Tech-

11. A. G. Rashin, "Gramotnost i narodnoe obrazovanie v Rossii v XIX i nachale XX v.," *Istoricheskie zapiski,* 37 (1951), tables 47 and 48, 72.
12. Allen Sinel, "The Socialization of the Russian Bureaucratic Elite: Life in the Tsarskoe Selo Lyceum and the School of Jurisprudence," *Russian History,* 3 (1976), 1-32.
13. Quoted in K. Timeriazev, "Probuzhdenie estestvoznaniia," *Istoriia Rossi v XIX veke* (St. Petersburg, 1909), 7:2.
14. Sinel, *The Classroom,* 207.

nological Institute found a majority of its students among sons of nobles or bureaucrats, trained in the elitist secondary schools, the gymnasia.[15]

The influx of an important contingent of students from modest, even poor background marked the appearance of educational aspirations among the middle classes during the 1870s. For these students, educational ideals focused on the opportunity for financial security and social honors. Some came from noble families whose fortunes were in serious decline. Others were from the upper and middle urban estates, as well as the priesthood, all increasingly numerous among university students between 1865 and 1880. Their presence was conspicuous among the upper class contingent because of "their excessively long coats, strong regional accents in conversation, their snuff pouch, and clumsy movements."[16] Poverty knew no estate limits, however. The prevalence of economic hardship among the university students was confirmed by a student survey in Kiev University in 1870, which revealed that over one-third of the respondents had no financial support from outside (parents, school, or state) and 70 percent were living on what the surveyors regarded as insufficient means.[17] Financial hardship plus difficult studies produced numerous drop-outs from the advanced schools (a memorable literary image of one appearing in the character of Raskolnikov in Dostoevsky's novel *Crime and Punishment*). Students whose lofty educational ideals focused on rational thought and commitment to political and social progress were dismayed by the apparently crass vocational interests of the "poor and undistinguished" students. These latter, in the writer Dimitri Pisarev's opinion, sought "the shortest road to rank, honor, large earnings, and consequently all the blessings and enjoyments of life."[18] Pisarev's goal of intellectual revolt was a luxury which the poor students, however much they might sympathize with it, could not afford.

What did they hope to obtain through schooling? Testimony of contemporaries uniformly answered that the rapid development of Russian economy, society, and the state was at the origin of the new influx of less advantaged students. The director of the Technological Institute explained in 1872 the flood of poor students in his school as a consequence of "the success of industry, the development of a widespread railroad network requiring a large number of specially trained technicians, and constantly increasing penetration of scientific elements into industrial production."[19] The Industrial Revolution in Russia was beginning to stimulate social mobility and professionalization, and the social profile of the advanced schools reflected the opportunities for social ascent these changes created.

Even more possibilities for employment were appearing in the burgeoning state and local administrations. These positions required higher learning credentials, in exchange for which they offered secure, honored positions in society. In 1875 a government commission observed that advanced schooling was "more than ever before attractive to poor youth," who saw that a university diploma would "open to them a

15. TsGIAL, f. 908, o. 1, d. 125, l. 88.
16. "Russkii vrach," *Sovremennik,* 89 (October, 1861), 582.
17. M. Benasik, *Studenchestvo v tsifrakh* (St. Petersburg, 1909), 8–10.
18. Dimitrii Pisarev, "Nasha universitetskaia nauka," *Izbrannye pedagogicheskie sochineniia* (Moscow, 1951), 125–26.
19. TsGIAL, f. 733, o. 158, d. 127, l. 37.

variety of enticing careers which did not even exist before."[20] Even educational authorities regretted the careerist attitude of this new type of student, seeking "not knowledge, but privileges and rights." As a result of the training being given these middle-class students, advanced schooling was facilitating "a transfer from one class of the population to another rather than the acquisition of education."[21]

Deplorable to the old elite, the educational path to social advancement opened up undreamed-of possibilities to the unprivileged and poor, whose numbers in Russia were legion. Among them were the Jews, to whom Alexander's reforms provided temporary hope for escape from the ghettos through education. When one Jewish medical student was expelled in 1874 for participating in student unrest, his father sent a petition to the minister of the interior begging for his son's readmission. "I am a poor man," he wrote, "without any capital or property and completely at the mercy of the future, for I depend [for my livelihood] on my work in the offices of the sugar factory." He had labored for forty years and had spent his "very last savings for the education of my son, in whom I place my sole support and hope."[22] The evidence thus suggests clearly that an awareness of the new possibilities for social advancement created by the sudden demand for an educated elite quickly penetrated the upper and middle classes of Russia, creating educational aspirations that were often impossible to achieve.

Among the obstacles to success, difficult studies presented the most immediate problem. Those students with the educational background and means to pursue their interests in good conditions stood a much better chance of graduating than others. A special report on graduates from Moscow University in the early 1870s found that, by comparison with overall enrollment, sons of the nobility were more highly represented among graduates than the lower class students, particularly the clerical students. The key factor was not social origin, however, but access to good secondary education. The clergy's offspring were less likely to have received a gymnasium education than noble youth, since most came from the secondary clerical schools, the seminaries.[23] Hence they had a much harder time surviving the rigors of university education. The result was to maintain the influence of privileged social background among the graduates of advanced schooling.

The government set out in the 1880s to fight the rising tide of middle class students. As in the time of Nicholas I, the motive was the fear of political radicalism among the students of unprivileged social class. The assassination of Alexander II in 1881 by a terrorist group led his son, Alexander III, to seek restrictive policies toward higher education. The most famous of these new measures tried to choke off the flow of undesirable students at the source—in the gymnasia. Named the "cooks' circular," this decree issued by the ministry of education in 1887 ordered that "with the exception of those gifted with extraordinary capacities," the "children of coachmen, servants, cooks, laundresses, small tradesmen, and the like" be discouraged from attending the gymnasia. In this revival of the static view of "the nature of things," the

20. Quoted in L. Kamosko, "Izmeneniia soslovnogo sostava," *Voprosy istorii*, Oct. 1970, 204–5.
21. TsGIAL, f. 733, o. 158, d. 210, 11. 13–14.
22. TsGIAL, f. 1282, o. 1, d. 339, 11. 287–88.
23. TsGIAL, f. 908, o. 1, d. 125, 1. 89.

minister declared that the "existing inequality of fortune" was "unavoidable" and that children should remain in "the sphere to which they belong."[24] In the same years, quotas were applied for the first time to Jewish youth seeking admission to the gymnasia and universities; Moscow and St. Petersburg universities could permit only two percent of their students to be of Jewish origin. The impact of these policies on university enrollments was dramatic; the table on student social origins reveals in the late 1890s a drastic decline in the proportion of the petty bourgeoisie, the very class most affected by the "cooks' circular" and anti-Jewish decrees.

The pressures for admission were nonetheless growing, most particularly among the country's Jewish population. When one young Jewish boy from the southern Ukraine was unable to enter his local gymnasium, his father, a well-to-do wheat farmer, obtained a place for him in the neighboring technical secondary school (Realschule). He was going, or so his father thought, to receive a good education in order to help manage the affairs of the farm. He did graduate from his high school and was even able to enter Odessa University; his formal schooling went no further, however, for he chose at that point to join the revolutionary movement, becoming as Leon Trotsky one of Russia's most brilliant Marxist radicals. This path to manhood represented precisely the educational pattern most feared by the state. Efforts of the secret police to keep tabs on the student population have provided us with records of another alternative chosen by Russian families—education abroad. A file on Russian students in the Paris School of Medicine in 1899–1900 reveals that 156 were enrolled at the school that year; of these, one half (76) were Jewish.[25] The choice of sending sons and daughters abroad for advanced learning was in most cases forced on the parents by government measures; that it was adopted at all is one clear indication of the rising aspiration for education among the Russian middle classes.

The socially restrictive policies of the Russian educational authorities preserved higher education in that country as the privileged domain largely of the nobility and bureaucracy. The rise of this new elite exactly parallels the growth of university education through the 19th century. Bureaucratic parents naturally sought to protect their social position by ensuring suitable training for their offspring. The social pressures behind this trend are vividly illustrated by the history of one famous Russian family. A son of a poor tailor from the Volga city of Astrakhan had in the years of Nicholas I been able, through hard work and much sacrifice, to receive an education at Kazan University, graduating from the Law Faculty. His immediate and most promising opening was teaching, but he soon moved into educational administration, playing an active role in the creation of a network of elementary schools in his district around the middle Volga town of Simbirsk. By the 1870s, his rank in the state administration was sufficiently high to earn him the title of hereditary noble. He had previously married the well-born and well-to-do daughter of a doctor. They had five children, all of whom graduated from gymnasia; some began advanced schooling. The eldest son, a brilliant chemistry student at St. Petersburg University, chose to put the salvation of the Russian people ahead of his own career, and was executed for

24. Johnson, 155.
25. Hoover Institution, Okhrana Index 13h, Folder 3, "Relève des étudiants russes à l'Ecole de médecine."

plotting against the life of Alexander III. The second son (who actually obtained his law degree at his mother's insistence) became as Vladimir Lenin founder of the Bolshevik party. Besides pointing up the futility of socially exclusive policies to guarantee student political loyalty, this Ulianov family history fits quite well the pattern of self-perpetuating prominence of the new (bureaucratic) elite among Russia's student population. In this respect the interests of the state leadership and of its bureaucratic servants were compatible, at the expense not only of the middle classes but also of the old landed nobility.

The last quarter-century of the tsarist regime witnessed the virtual capitulation of the state to the pressures for professionalization through expansion of enrollments in higher education and for access to education by the middle classes of the country. This change began in the 1890s with the development of an extensive network of technical schools and institutes under the ministry of finance, most aware of the need for educational training, then accelerated after the revolution of 1905. So many openings in the technical institutes and universities could be filled only by granting entrance to the new middle classes and lower middle classes in greater numbers than ever before, creating what in the eyes of conservatives could only be called a socially promiscuous student body. The vocational interests of the middle classes led them to turn particularly to the technical schools. For five schools in 1914 with about one-third of the total professional enrollment, the merchantry and petty bourgeoisie contributed over one-half of the students, and sons of "peasants" another one-fifth.[26] Similarly, Moscow University proved responsive to these pressures; as center of Russia's new industrial economy, it too was by 1916 predominantly made up of students from the urban, "enterprising" classes.[27] St. Petersburg University remained more heavily weighted toward the nobility/bureaucracy, since it was the chosen springboard for entrance into the state administration. Similarly, the newly created network of women's courses catered largely to the daughters of the country's elite (old and new). Overall, the trend toward democratization of the student population appears the result of the primacy of socioeconomic development, that is, of the needs of the state for educated Russians, and of the demands of the new classes for education for their offspring.

Some students regarded themselves, though, as in no way beholden to their parents. In contrast to the efforts of many to remain as adults in a position equivalent to or better than that of their parents, a sizeable group since the 1860s openly renounced all ties to parents and to the estate dignities of birth. This is not the place to discuss the forces which reshaped the mentality of this "student corporation."[28] The declaration of a student leader in St. Petersburg University in the late 1850s is indicative of the attitude he saw emerging among his classmates. He asserted in a speech to a student gathering that "in the face of learning, there are no estates or titles or uniforms." No longer were student youth to be divided by estate loyalties as "petty

26. Johnson, table 34, 290.
27. M. Tikhomirov (ed.), *Istoriia Moskovskogo universiteta* (Moscow, 1955), 1:368-69.
28. See Daniel Brower, *Training the Nihilists: Education and Radicalism in Tsarist Russia* (Ithaca, N.Y., 1975), esp. ch. 4.

bourgeois, merchants, bureaucrats, officers, or well-born Russian nobles," for there remained "only adepts of learning."[29]

Though the entire student body never resembled such an exhalted image of apostles of truth, student culture over the following half-century nurtured an attitude of alienation toward family and class among at least a part of the youth in higher education. When it became possible after the revolution of 1905 to conduct public opinion surveys, students had the opportunity to express themselves on this issue. One survey at Moscow University asked 1,700 students whether their parents had had any part in the elaboration of their philosophy of life; 58 percent denied that they had. When asked if the parents had had any influence on the choice of academic study, 84 percent denied that they had. The commentator of these statistics concluded that "the Russian intelligentsia has no family."[30] In effect, higher education made its own contribution to the fires of social conflict. From the ranks of these disaffected students came the cadres of the revolutionary parties, claiming leadership of the discontented lower classes in the movement to overthrow the tsarist regime.

The Bolshevik Pattern:

Political realities, of diminishing importance for educational recruitment in the late tsarist period, became a major factor once again after the Bolshevik Revolution. The new leaders were themselves products of an elitist educational system, trained in rigorous humanistic subjects and survivors of the ruthless process of selection which eliminated so many youths. If some never completed their training, the choice was theirs, based on the decision that revolution was more important than an academic degree. The first commissar of education, Lunacharsky, appeared only briefly in the University of Zurich, where an interest in philosophy led him to Marxism and soon to the revolutionary Marxist underground in Russia. As new leader of the educational system, one of his first moves was to eliminate all entrance requirements to the university. A September, 1918 decree of the commissariat declared that university studies were open "to any person, regardless of citizenship or sex, who has attained the age of 16."[31] Democratization of higher education eliminated all handicaps, social, financial, or racial, to talented Soviet citizens seeking access to advanced learning. Lunacharsky's ideal educational system was one in which "every child of the Russian Republic enters a school of an identical type and has the same chances as every other to complete higher education."[32]

However, the concept of democracy had special meaning for the new revolutionary leaders. They had overthrown the old order in the name of and for the sake of the laboring masses. The exploiting classes, on the other hand, were by their very origins

29. Cited in B. Modzalevskii, "Iz istorii Petersburgskogo universiteta, 1857–59 (Iz bumag L. N. Modzalevskogo)," *Golos minuvshego,* January 1917, 141.
30. M. Izgoev, "Ob intelligentnoi molodezhi," *Russkoe obshchestvo i revoliutsiia* (St. Petersburg, 1909), 197–98.
31. Quoted in Sheila Fitzpatrick, *The Commissariat of Enlightenment* (Cambridge, 1970), 77.
32. Quoted in Gail Lapidus, "Socialism and Modernity: Education, Industrialization, and Social Change in the USSR," in Paul Cocks et. al. (ed.), *The Dynamics of Soviet Politics* (Cambridge, Mass., 1976), 201.

potential enemies of the people. The Soviet state had to support the people and to crush the former ruling classes who would, if given any opportunity, seek to sabotage and overthrow the new class dictatorship. Education was not exempt from class struggle. Some leaders immediately sought to introduce class policies into the classroom. One of these militant educators was E. A. Preobrazhenskii. For him there existed "a genuine class war at the doors of the advanced schools between the worker-peasant majority of the country ... and the [former] governing classes and strata linked with them." At issue was "the question of the numbers and social origins of the future specialists." Though "the bourgeois and intellectual strata of the population are frantically trying to maintain themselves and their children at the level of education and social position reached in the pre-revolutionary period," the working masses want "to have specialists from among their own kin in their own state."[33] The lines were drawn between education open to talent and proletarianization. The policies of the 1920s oscillated first one way, then the other as the Soviet state sought the solution to this dilemma.

All sides could at least agree that special measures needed to be taken to help the working classes overcome their great educational handicap and to provide assistance to those workers seeking to enter higher education. The first practical step in this direction was taken in 1919 by Communist students in a Moscow technical school, who organized special preparatory courses for workers applying to their school. The idea was adopted by the commissariat of education that fall, which called for "preparatory courses at all Russian universities with the aim of preparing workers and peasants for higher education in the shortest possible time." Finally, a year later the Council of People's Commissars of the Russian Republic gave these courses for workers (in Russian *rabochii fakultet,* shortened to *rabfak*) legal status, specifying that admission to such schools was open to workers and peasants sent by Communist party organizations, labor unions, factory committees or local governmental organs. Non-party individuals not engaged in manual labor were excluded, no matter who might recommend them.[34] The movement spread quickly. By 1926 there were 65 *rabfaki* with 33,000 students. Of these, slightly over one-half declared themselves workers, and another 39 percent peasants.[35] These figures are really only approximations, since evidence of social origins was frequently falsified. Nonetheless, the program represented a radical departure in educational recruitment, a program never attempted in any country before and one which successfully opened up higher education to many thousands of workers who in earlier years would have had little chance of such educational opportunities.

Proletarianization of higher education quickly raised the proportion of workers and peasants in universities and technical schools. Specific governmental guidelines designated 8,000 openings in the universities in 1925 (out of a total of 18,000) for *rabfak* graduates, and another 5,000 for individuals recommended by party, Young Communist or trade union organizations.[36] Moscow University claimed to be admit-

33. Lapidus, 204.
34. V. V. Ukraintsev, *KPSS: Organizator revoliutsionnogo preobrazovaniia vyschei shkoly* (Moscow, 1963), 71–73.
35. Lapidus, table 11.1, 208.
36. Lapidus, 203.

ting 70 percent from the laboring classes among its entering class of 1924.[37] Overall figures on institutions of higher education in 1926 show that almost one-fourth of the students were classified as workers, and the same percentage as peasants. The offspring of the middle and former upper classes (noted as "white-collar employees" and "other") represented now only one-half of the enrollment.[38]

The continued presence of the children of socially undesirable classes was hardly surprising. The educational leaders and school authorities both continued to seek compromise between proletarianization and talent. Students capable of undertaking difficult advanced studies were most frequently of middle and upper-class origins. State policy openly encouraged families of technical specialists who worked for the Soviet state, "progressive" even if their origins were bourgeois or noble, to send their children to advanced institutes. The heritage of generations of students from these classes could not be eliminated immediately, particularly as long as intellectual ability was considered important. At insignificant little schools such as Smolensk State University, a new creation of the Soviet state, recruitment into medical school posed real problems. A survey of some of the medical students conducted in 1924 revealed that only half could furnish documents certifying that they were of politically acceptable social origin, proletarian or working peasant. The survey also revealed that the students were remarkably alike in lacking party or Young Communist affiliation, and in having to support themselves by work to supplement miserable stipends, living on the verge of poverty.[39] The picture was a familiar one; like the tsarist leaders, the Communists of the 1920s had to live with a socially promiscuous mixture of students, and had to maintain a system of higher education on a slim budget.

The second factor preserving the place of the former advanced classes in the educational institutions was the reluctance of many Russians even to consider such education desirable. The impact of open enrollments in the universities had at the start led to an increase of middle-class students. One Moscow University professor commented that "the proletarian masses did not come to us; it was the intelligentsia that came."[40] Though the *rabfaki* helped alter attitudes, the change (like that of the landed nobility in the early 19th century) was slow in coming. A survey in 1925 among 2,000 peasant families revealed that only three percent even conceived of the possibility of the completion by their sons or daughters of higher education.[41] When educational specialists studied the length of time rural and urban children remained in school in the 1920s, the results of rural distrust of advanced schooling were clear. Few rural boys and girls completed secondary education. As in late tsarist times, a stay in school of two or three years was sufficient for peasant children, whose parents still worked their own land and thus needed family labor.[42]

Democratization was a boon to the Jewish families. All restrictions on Jewish enrollment were lifted by the Soviet state. The result was a rapid rise in the proportion

37. *Istoriia Moskovskogo universiteta,* 2:102.
38. Cited in Lapidus, table 11.1, 208.
39. Merle Fainsod, *Smolensk under Soviet Rule* (Cambridge, Mass., 1968), 343-44.
40. Quoted in Fitzpatrick, 77.
41. Cited in David Lane, "The Impact of Revolution: The Case of Selection of Students for Higher Education in Soviet Russia 1917-1928," *Sociology,* 7 (1973), 247.
42. Lane, table 5, 248.

of Jewish students, particularly in the western areas (the former Pale of Settlement). In the entire country, they represented 16 percent of the students in higher education in 1927, while in the Ukraine their proportion was 26 percent. Their importance in some of the professional schools, such as medicine, was even greater; 45 percent of the Ukraine's medical students were Jewish in 1927.[43] Since most of the country's Jews had been engaged in small-scale trade and artisan activity, their social credentials were good, and their ability to master challenging academic subjects was probably greater than that of a comparable group from the Russian population. Ultimately the Russian Communists, like their tsarist predecessors, turned to anti-Jewish discriminatory policies to preserve Russian predominance in higher education.

Women students also took advantage of the new policy of enrollments and the inducements to seek new careers previously open only to men. In the cities, the proportion of girls completing secondary education was greater than that of the boys by the late 1920s.[44] Their impact on higher education was especially noticeable in the technical schools, where they represented 42 percent of the students in 1928.[45] In the new Soviet society, the emancipated woman frequently sought specialized skills through education. Stalin's second wife, Nadezhda Allilueva, came from a Bolshevik worker family in which education was encouraged for all, including the daughters. She completed her secondary education in the midst of revolution and civil war. A decade later, she returned to study in the Industrial Academy of Moscow, where for a time she worked alongside a young worker Communist from the Ukraine named Nikita Sergeevich Khrushchev.

The makings of the new Soviet elite were visible in institutions such as this one. The working class had by the mid-1920s occupied a share of the openings in higher education greater than its proportion of the entire population.[46] The result represented in one sense a continuation of the democratization process evident in the late tsarist years, testimony to the increasing desire for higher education among larger and larger numbers of Russians from all classes. It also reflected the new political power of the proletariat, many of whose members had—like Khrushchev—entered the party since the revolution and were seeking to achieve economic expertise through learning as well as political power. One Western scholar has recently argued that the Young Communist organization and new worker Communists pushed particularly hard to have the Soviet state open up to workers and peasants special access to higher education by ending the policy of democratization and introducing socially discriminatory policies. She suggests that they did so primarily to be able to use education as a means of "upward mobility *out* of the working class and peasantry" for entry "into the new ruling elite of the Soviet state."

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43. Salo Baron, *The Russian Jew Under Tsar and Soviets* (New York, 1964), 273.
44. Lane, table 5, 248.
45. Lapidus, 207.
46. See James McClelland, "Proletarianizing the Student Body: The Soviet Experience during the New Economic Policy," *Past and Present*, 80 (1978), 134–35. He calculated that the selectivity index for students of working class origin was 1.1 in 1923/24, and had risen to 1.6 in 1927/28. By contrast, that for "employees" (i.e., all students whose parents were not engaged in manual labor) was 6.3 in the latter year; peasants remained greatly underrepresented among the students (index of 0.2).

Their educational aspirations developed more rapidly than governmental policy was ready to admit. Until the late 1920s, their appeals went unheeded. Academic standards remained high, with the natural result that few of the worker recruits to advanced schooling graduated. By 1928, a mere 10,000 Communists had completed some sort of advanced schooling.[47] Only a radical change in educational policy would permit these politically active workers to achieve the educational credentials necessary to occupy influential positions in the state and economic apparatus of the new Communist regime.

With Stalin's rise to power, proletarianization of higher education became state policy. The days of free enrollment in higher education were ended; purges of the student body sought out and expelled the "socially alien elements" (who probably in many cases found openings in other institutes, so chaotic were conditions and so easily were documents falsified). When the educational system expanded rapidly during the First Five-Year Plan, many of the new openings went to adult workers and peasants sent to receive special training as part of the new party elite. This Soviet "affirmative action" brought by one estimate 150,000 adult workers into the Soviet student body between 1928 and 1932.[48] The dilemma of democratization *versus* proletarian power was resolved in the Stalinist manner. Once again higher education became the tool of political leaders seeking above all to protect and enhance their own power.

In effect, Stalin achieved in a decade what the tsarist regime had gradually created in the first half of the 19th century. The autocracy needed a bureaucracy to implement new policies of social and political reform. It found its first recruits largely among the old elite. Yet the process of social expansion of the state administration created its own pool of recruits for higher education. One hundred years later Stalin, once he had decided on the necessity of "proletarian cadres" for his new regime, cultivated the ambitious new Communists from the working class, offering them special educational advantages and an active role in his socialist society of the 1930s in exchange for their loyalty and service. They, like the state bureaucracy of the 19th century, sought advantages for their children, using higher education as the means to protect family status from generation to generation.

In conclusion, this study of Russian higher education and social stratification points to the primacy of politics. Admission to institutions of advanced learning reflected above all the policies imposed by the regime. One might also conclude that the disadvantaged groups in Russian society seeking schooling proved remarkably ingenious in finding openings in spite of the restrictive policies. Higher education was perceived by the early 20th century as the path to social advancement by middle as well as upper classes, and in the 1920s this awareness apparently spread among the working class. But admissions could not respond naturally to these pressures from below as long as the government applied its discriminatory practices. Between the regime and society, the struggle was an unequal one. Control over higher education gravitated to those in power. Those who served the state well could find among their rewards access to higher education. This rule was true in the 1840s and remains so today.

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47. Sheila Fitzpatrick, *Education and Social Mobility in the Soviet Union, 1921-1934* (New York, 1979), 16-17, 110.
48. Fitzpatrick, 187-88.

Richard Angelo

The Social Transformation of American Higher Education*

Detailed answers to questions about changes in the size and social composition of the student population serviced by colleges and universities in the United States between 1860 and 1930 are not readily available. It is generally recognized that more students, and more different kinds of students, attended institutions of higher learning in this period. But we do not know nearly as much as we might like about which groups contributed to this trend, or what significant variations there were in the pace and social character of this transformation in different curricula in the same institution, or in the same curricula in different schools.[1]

On the assumption that even a crude picture is to be preferred to no picture at all, the "social transformation of American higher education" will be examined through the backgrounds of approximately 2,000 alumni of the University of Pennsylvania. This sample was drawn from among alumni of the College as well as the professional schools beginning with the classes of 1873, the first to graduate after the University's move to its third and present home was complete, and for 62 consecutive years thereafter. It also rests, though in less detail, on another group of 1,000 alumni of Temple University which was founded originally as the "Temple College of Philadelphia" in 1888. Approximately 30% of the Temple sample represents the school's first generation of alumni. These students were in attendance between 1892 and 1906 before

* An unusually discerning editorial guidance provided by Konrad Jarausch enabled me to improve substantially on an earlier version of this essay. I would also like to acknowledge the assistance of P. M. G. Harris whose instruction and example were indispensable to me when I first began to investigate the Temple and Penn alumni.

1. For a useful overview see D. Potts' review essay of D. Allmendinger's *Paupers & Scholars*, "Students and the Social History of American Higher Education," *History of Education Quarterly*, 15 (1975), 317-327, as well as J. McLachlan, "The American College in the Nineteenth Century: Toward a Reappraisal," *Teachers College Record*, 80 (1978), 287-306. See also R. Frankfort, *Collegiate Women: Domesticity and Career in Turn-of-the-Century America* (New York, 1977); H. S. Wechsler, *The Qualified Student: A History of Selective College Admission in America* (New York, 1977); and M. G. Synnott, *The Half-Opened Door: Discrimination and Admissions at Harvard, Yale and Princeton, 1900-1970* (Westport, Conn., 1979).

Temple officially became a university in 1907. The remaining 70% of the sample represents Temple's third generation which graduated between 1925 and 1935.[2]

There are some good reasons to think that Temple and Pennsylvania are apt institutional choices for this purpose, particularly when considered together. First of all, their common location in a major American city recommends them. While it had a population of approximately 500,000 people in 1860, by 1930 Philadelphia had become an "Industrial Metropolis" with "a unique social and spatial organization." "Neither the nineteenth century city grown larger," as Sam Bass Warner has characterized it, "nor today's megalopolis constricted," Philadelphia had become the "third largest city in the nation, and one of ten whose population exceeded one million inhabitants."[3]

Second, these institutions themselves display a distinctive and contrasting historical character. Penn was born and nourished in Philadelphia when it was still an 18th-century town. One of nine institutions of higher learning in the colonies before the

2. E. P. Cheyney, *History of the University of Pennsylvania* (Philadelphia, 1940). Commencement figures for Temple and Penn were compiled by counting all the names in all curricular categories found in the annual commencement programs. Once these figures were tabulated, the Penn sample was assembled by drawing names from the programs on a fixed percentage basis across all curricula for groups of consecutive years.

1873–1892 (1/10) = 283	1916–1921 (1/25) = 213
1893–1898 (1/15) = 178	1922–1925 (1/40) = 148
1899–1904 (1/20) = 163	1926–1930 (1/40) = 223
1905–1909 (1/20) = 146	1931–1935 (1/40) = 225
1910–1915 (1/25) = 194	

The University of Pennsylvania's archives contain a "biographical folder" for virtually every alumnus as far back as 1757, which served as the first source of biographical information on the 1,773 alumni in the sample. This source was supplemented with matriculation records of individual departments or colleges within the University, yearbooks, class histories, and, at least in the case of the alumni who made their homes in Philadelphia, the city directories.

For the years prior to 1926, Temple's student records are scanty at best, since registration cards bear little more than a name and an address. For the years after that date, however, registration cards carry such information as home address; city adress; date and place of birth; when and where naturalized if foreign-born; religious affiliation; father's occupation; and schools attended before coming to Temple. Where the material was the richest, sampling the Temple alumni was handled as it was at Penn:

Degree Recipients:	1926–1930 (1/12) = 236
	1931–1935 (1/20) = 259
Certificates:	1927–1935 (1/10) = 214

In cases where occupational information was missing from the cards of these 709 alumni, city directories were consulted to fill in the gaps. For most of Temple's first generation, on the other hand, information provided by the city directories is all we have to go on. A check was made on all of the 169 individuals who received the 171 degrees Temple conferred between 1892 and 1906, along with a sample of 130 students who matriculated in the institution's Evening Department for a course or two during the 1894–1895 academic year. A full discussion of Temple's first generation, as well as the Penn alumni between 1873 and 1898 can be found in Angelo, *History of Education Quarterly*, 19 (1979), 179–205.

3. S. B. Warner, *The Private City: Philadelphia in Three Periods of its Growth* (Philadelphia, 1968), 50, 161.

Revolution, it necessarily faced urbanization with an aristocrat's sense of tradition and its own preeminence. Both were tested as Pennsylvania began adding new curricular possibilities and modifying long-established ones after 1880 and as it began receiving new students and losing some of its traditional clientele to increasingly more prestigious members of the Ivy League. In contrast, Temple was a late-19th-century newcomer, and because its circumstances were very different, so were its problems. Founded with nothing to preserve at a moment when Penn was beginning to take new pride in its colonial origins, Temple sought a bit presumptuously at the outset to inaugurate a new tradition, or perhaps to make good on principles elided in the old, by offering a remarkably wide variety of instruction on terms that would make it easily available to virtually anyone.[4] "No special grade of previous study is at present required for admission," the College's first bulletin announced in 1888, "as the purpose of the faculty is to assist any ambitious young man." By the mid-1890s, the catalogue would proclaim with pride that Temple was "the only College in the land" prepared to "take the child just able to talk, and graduate the young man or woman with a degree equal to any college in the country; or send them forth with a full and complete business training, fully equipped for business life."[5] More inclusive than exclusive on almost any measure when the period began, what Temple needed was respectability and some curricular direction.

Finally, the experiences of Temple and the University of Pennsylvania are useful within the interpretive context of the historiography of American higher education. Penn figures only peripherally in the received literature, and then only in terms of the *College,* the smallest portion if its curricular endeavor through much of the period, while schools like Temple are systematically excluded altogether. Historians are free to study what they choose, of course: the question is whether the literature's deep-seated proclivity to focus on the baccalaureate program—and at the distinguished schools at that—distorts as a whole our understanding of the nature of the transformation of higher learning in the period. Virtually identical shifts in the contours of the curricular experience of both of these institutions suggest that this is precisely what has happened.

The Institutional Pattern:

In *The Emergence of the American University,* Laurence Veysey has distinguished among "at least three major kinds of academic institutions" at the end of the 19th century "on the basis of their undergraduate atmosphere":

> (1) The homogeneous eastern college, internally cohesive and sharply isolated from the surrounding American society. Of this pattern were Princeton, Yale, the early-day Columbia, and most of the small New England colleges. (2) The heterogeneous eastern university, containing a great variety of discordant elements among its student population and mirroring, if in top-heavy fashion, the social gamut of the area at large. Pennsylvania, the latter-day Columbia, and, above all, Harvard carried this stamp. (3) The heterogeneous western university, which better reflected

4. "Virtually anyone" since blacks were not welcome at the outset. See W. E. B. DuBois, *The Philadelphia Negro: A Social Study* (New York, 1967 edition), 349-350.
5. Temple College, *Bulletin, 1888-1889;* Temple College, *Catalogue, 1896-1897.*

the surrounding society, as did its eastern counterpart, but, because western society was less diverse, offering fewer internal contrasts in practice.[6]

It is worth emphasizing that Veysey offers these distinctions as a matter of institutional contrasts primarily. Notwithstanding the differences he mentions here between schools that were "sharply isolated" and those that "better reflected the surrounding society," he uses this institutional spectrum to highlight relative differences in the socio-economic complexion of the undergraduate populations at institutions within the same region or in different regions at a particular point in time, not between the student population and the population at large. When seen in the "broader perspective," he observes later, "both the 'homogeneous' and the 'heterogeneous' universities were, after all, relatively homogeneous," and this was true not only in the East but in the "younger part of the country" as well.[7]

Within the full argumentative context of the book, these late 19th century contrasts are in the service of a larger and simpler historical one: when compared with their counterparts 50 years before, the turn-of-the-century undergraduate population had grown larger and more diverse.[8] The emergence of the American university is a late-19th-century phenomenon for Veysey, the successor institution of the American college which had been coping as best it could with sagging enrollments and eroding influence since the 1820s. The unprecedented influx of large numbers of undergraduates was the chief token of the public's acceptance of the American university. Ironically enough, however, like the resolution of the lively intramural quarrels over purpose and control which created the new and newly habitable institution, that extramural acceptance represented a marriage of convenience at best. On Veysey's account, it was not unanimity that held the university together, but ignorance of a total situation most often tolerant and flexible enough to allow the major participants to keep their own counsel. This was true of the relationships within the faculty ranks between partisans of Utility, Research and Scholarship. It was also true of the relationships between faculty of whatever stripe and the administration on the one side, and between faculty and the undergraduate on the other. By 1910, "in every sense except that of quantitative aggrandizement," the "structure of the American university had assumed its stable twentieth century form."[9]

Thanks to subsequent research, we are now beginning to appreciate our failure to reckon with the late-18th-century presence of the "university" itself, as well as the extent to which we have underestimated not only the scale and socio-economic variety of the 19th-century student population, but the vitality and social significance of the 19th-century college.[10] The examples of Temple and the University of Pennsylvania are particularly useful for our understanding of turn-of-the-century developments within the context of this debate. Veysey's use of the baccalaureate curriculum as a synecdoche for understanding the "university" as a whole is an anachronistic view, which makes sense only as a *result* of the transformation of higher learning. Invoked

6. L. R. Veysey, *The Emergence of the American University* (Chicago, 1965), 283.
7. Veysey, 333, 329, 440. In this paper we, too, shall confine ourselves to internal contrasts—to what John Craig elsewhere in this volume calls "numerators."
8. Veysey, 271. On size, see 338-339.
9. Veysey, 337-338.
10. Cf. McLachlan, "The American College in the Nineteenth Century."

tacitly and prematurely, it affects his representation of the nature and the scope of the institutional transformation, as well as his depiction of the dynamics of change in the size and social composition of the student population. What was, therefore, the nature of the larger shift in the character of the institutional container in which students circulated?

Temple did not have an "undergraduate atmosphere" to speak of prior to 1906, since it conferred relatively few degrees of any kind at the outset (Graph 1). Of the 171 degrees Temple did bestow between 1892 and 1906, 45% were in law, medicine, and pharmacy. Of the remainder, nearly one-quarter were Bachelor's degrees in oratory and elocution, and the rest were almost evenly divided between degrees in theology and the liberal arts.[11] Temple's merger with the Philadelphia Dental College in 1907 brought large numbers of young men to the commencement platform for the D.D.S. in subsequent years. These degrees in dentistry, along with those awarded in pharmacy, medicine and law accounted for the bulk of all degrees awarded by Temple until the early 1920s. Only then did the number of Bachelor's degrees awarded in liberal arts begin to increase enough, along with those conferred by the new programs in education and commerce, to become a visibly significant part of the instructional story. During the late 1920s and early 1930s, the number of annual baccalaureate degrees superceded the number of professional degrees for the first time. An increasingly anomalous vestige of the past, the number of certificates awarded, began to fall in the early 1920s, and by 1935 had dropped to its lowest point in 20 years. The certificates that remained were now seated within what had become a new internal economy of instructional effort and significance.[12]

A conception of the East's "heterogeneous" academic establishments which makes exemplary the "undergraduate atmosphere" at late-19th-century Pennsylvania, Columbia "and, above all, Harvard" has little potential to render the experience of Temple and schools like it intelligible. Such a view erases that experience instead. No doubt Veysey would point out that, like the majority of "the five hundred institutions of higher learning in the United States in 1903," Temple did not really "deserve the title of 'college'" at all. During the early years of this century, "it was estimated that only a hundred colleges held to standards that would permit their students to begin immediate study for the Doctorate after receiving the A.B., and only a dozen or so were clearly universities 'of the first rank.'" Like the junior and community colleges which flourished after World War II, Temple and schools like it at the turn of the century were "so closely related to the public school system that it may be questioned whether they are part of 'higher education' in more than a nominal sense."[13]

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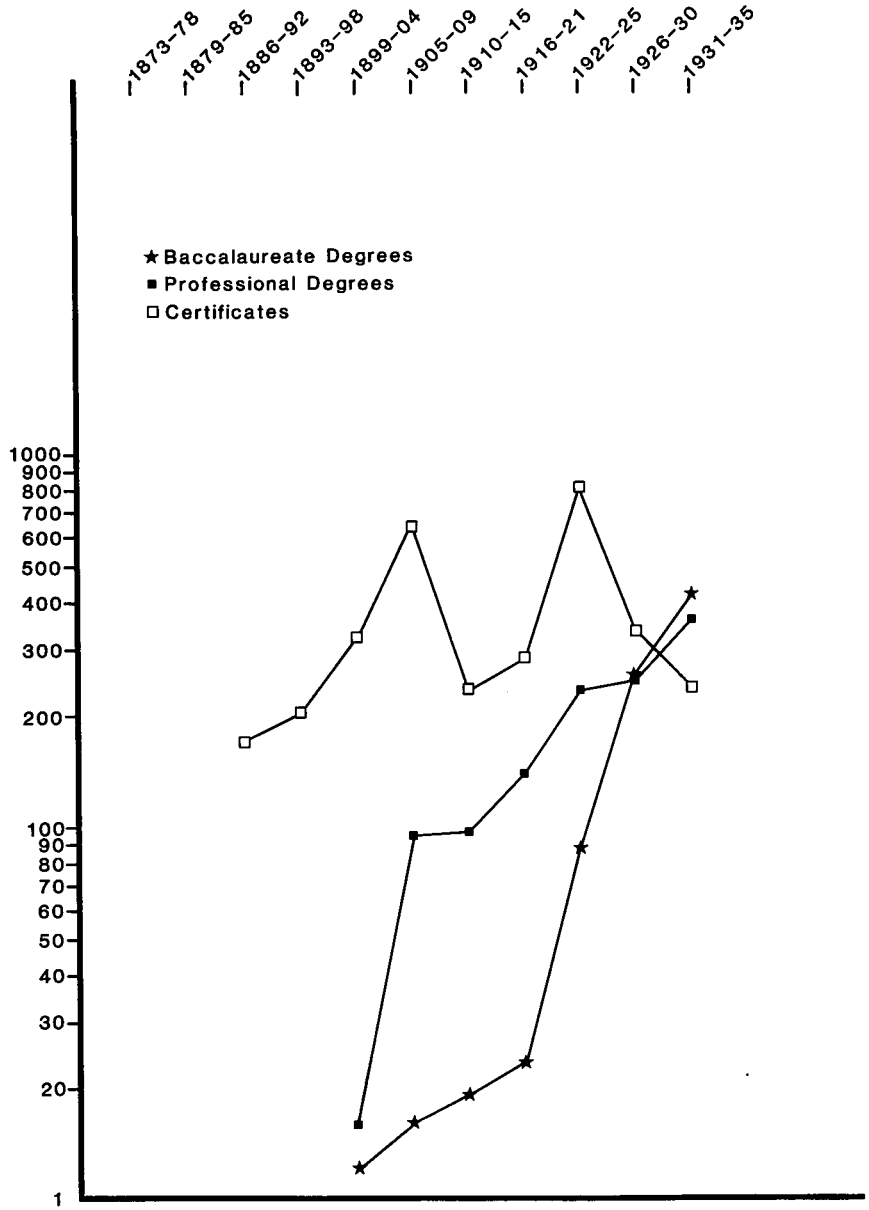
11. The intermittent scattering of degrees conferred prior to 1899 could not be represented on the graph as "averages for groups of years" without distortion.
12. The bulk of the certificates conferred between 1927 and 1935 fell into the categories of commerce, nursing or oral hygiene or education. Crudely speaking, the clientele for Temple's certificates can be divided into two groups. Protestant women from small town Pennsylvania who ranged in age from 19 to 28 and often had not completed high school dominated hygiene and nursing. Jewish and Catholic students from the city who ranged in age from 14 to 40 predominated in commerce.
13. Veysey, 359, and note 237, on 338.

Graph 1: Average Number of Baccalaureate Degrees, Professional Degrees and Certificates Conferred by Groups of Years, Temple University, 1892–1935



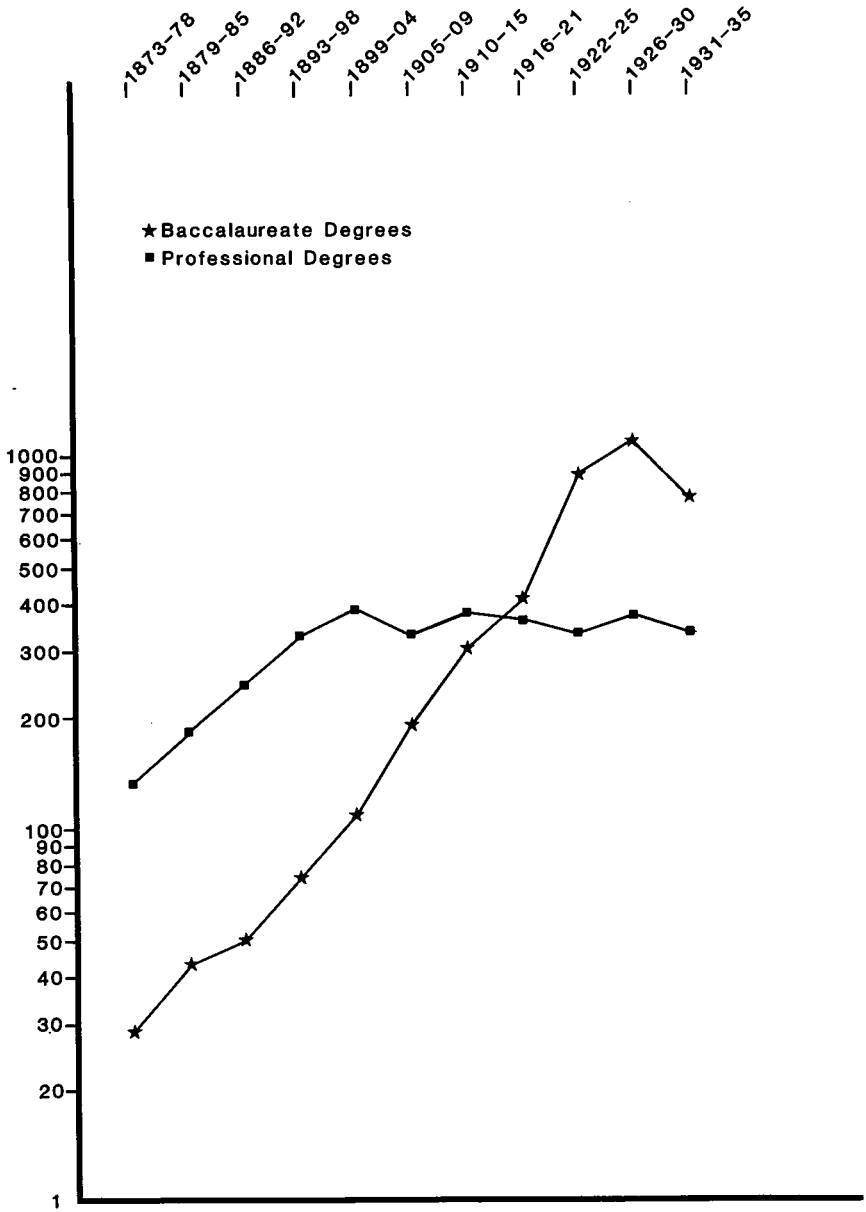
Veysey's typology would be more convincing were it not for the fact that it blots out the experience of the University of Pennsylvania also. In its hard-nosed insistence on quality, combined with a preoccupation with undergraduate and graduate instruction in the liberal arts to the exclusion of all else, this interpretation averts the simple recognition that Pennsylvania deployed its available instructional energies in ways similar to Temple at the end of the 19th century. In the years that followed, moreover, Penn's character as an ensemble of instructional possibilities experienced a realignment parallel to the transformation at Temple, though it came roughly a decade sooner. In terms of sheer numbers, Penn was only peripherally in the undergraduate business prior to 1905 (Graph 2). An increasingly significant share of its expanding curricular efforts was directed toward baccalaureate programs in the liberal arts, engineering, business and education after that date, but it was not until the early 1920s that the total number of degrees awarded in these undergraduate curricula combined exceeded the total in medicine, dentistry, law and veterinary science.

Penn and Temple enrollments not only raise questions about the centrality of the baccalaureate curriculum, but record something more than that. During the first 35 years of this century, medicine, law and dentistry undertook more or less successful initiatives to become post-baccalaureate curricula. It is not the case, therefore, that the late-19th-century "university" boasted two curricular domains (one labeled "professional," the other "undergraduate"), and that one simply grew larger while the other grew smaller up to the 30s. More significantly, those domains themselves were changed internally, as well as in their relationship to one another. At first some, and then a full round of undergraduate experience ceased to be merely desirable or a luxury, but became instead a necessary condition for access to professional (new "graduate") study and practice. In the years following World War I the baccalaureate curriculum *became* central to the formal educational experience of those who attended the university, and it is only under such circumstances that we can plausibly use that *portion* of the institution's total instructional endeavor to make sense of the *whole*. As first one and then another of the refurbished professional curricula dislodged themselves from their longstanding equality with the classical A.B. and took up their new position "above" it, the expanded and updated baccalaureate curricula, like the university itself, became "post-secondary" to a formal degree unparalleled in the 19th century. The attorney or the physician who never studied for a Bachelor's degree was already something of an anomaly as a result, like the dentist or pharmacist who completed only a year or two of high school.

A good deal more needs to be said about these changes, but that would take us well beyond the scope of this essay.[14] The general conclusion to be drawn from the transformation in the university's overall character as an instructional site is straightforward enough, however. Veysey's distinction between "homogeneous" and "heterogeneous" Eastern academic establishments is not at issue here in principle, but the truncated and unduly foreshortened way in which he has filled it in. When held

14. See T. F. Green's *Predicting the Behavior of the Educational System* (Syracuse, 1980), and F. Hirsch, *The Social Limits to Growth* (Cambridge, 1976). For exemplary application of theory see William R. Johnson, *Schooled Lawyers: A Study in the Clash of Professional Values* (New York, 1978) and David Noble, *America By Design: Science, Technology and the Rise of Corporate Capitalism* (New York, 1977).

Graph 2: Average Number of Baccalaureate Degrees and Professional Degrees Conferred by Groups of Years, University of Pennsylvania, 1873–1935



against Princeton at the end of the 19th century, perhaps Pennsylvania did look "heterogeneous." In terms of its own history, however, Penn was more homogeneous socially at that moment than at any other during the 63-year period under consideration here. What can, therefore, be said of its students?

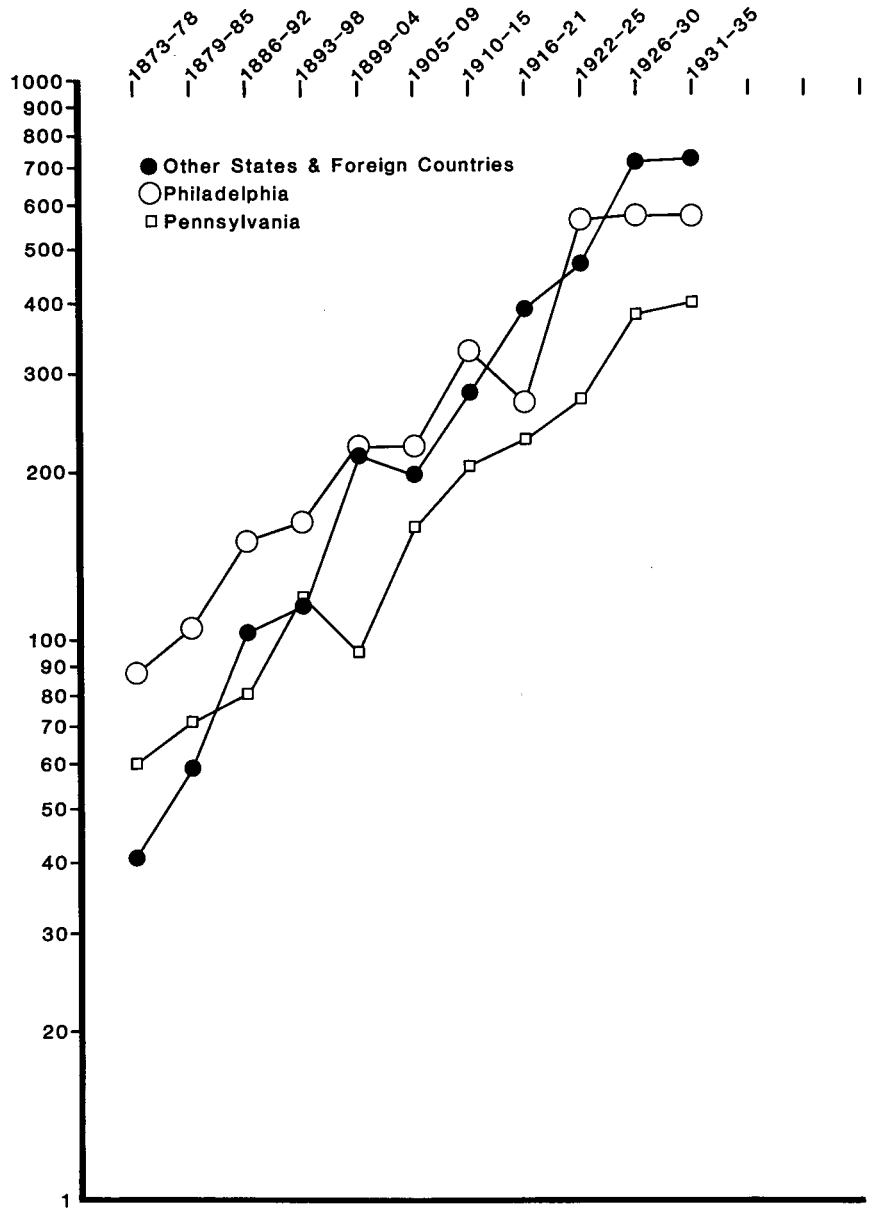
Enrollment Size and Regional Recruitment:

As we might expect, students from Philadelphia together with those who made their home in rural or small-town Pennsylvania accounted for the largest proportion of the University of Pennsylvania's alumni between 1873 and 1935. Although the numbers of graduates from the city grew a bit faster than those from outlying areas (at about 7.8% per year for Philadelphians, about 5.3% for those from Pennsylvania), both of these contingents were roughly seven times as large in the 1930s as they had been in the 1870s (Graph 3). The most significant transformation of Penn's student population on this measure, however, occurred with the influx of young men from other states and foreign countries. Their numbers grew the fastest (about 11% per year for the entire period), already equaling or outstripping the smaller but steady increase in the numbers of those from Pennsylvania by the 1880s and 1890s, and finally equaling and surpassing those from Philadelphia between 1899 and 1921. If Philadelphians accounted for almost one-half of the alumni in the 1870s (47%), the sample argues that their proportion had declined to about 33% by the 1920s. Whereas students from Pennsylvania who resided beyond the city limits accounted for 31.5% of the alumni in the 1870s, by the 1930s their proportion looked more like that of students from other states and foreign countries when the period began, dropping off to about 23.5%.

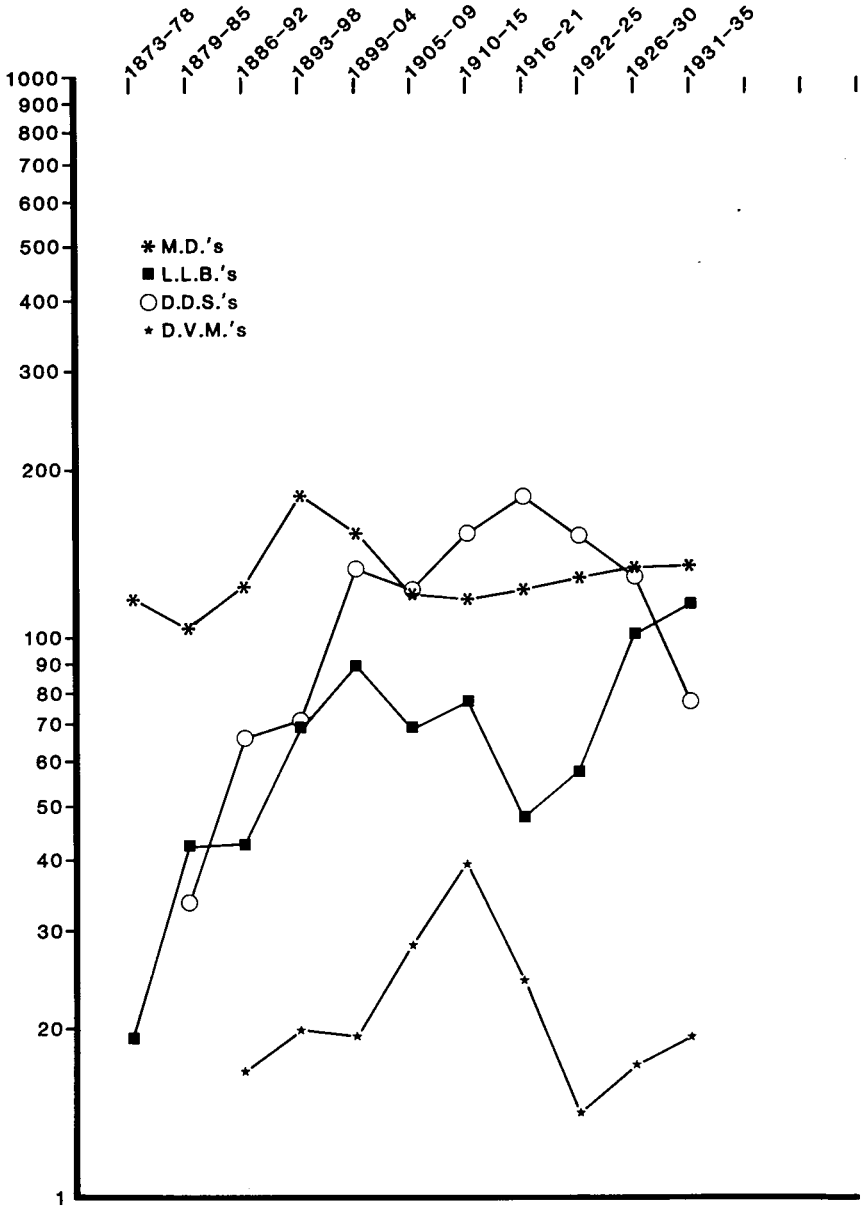
Although Penn steadily grew larger and more cosmopolitan between 1873 and 1935, the picture varied from curriculum to curriculum. It looked different, first of all, in terms of simple patterns of growth. The medical program, for example, was the largest of any of Penn's instructional endeavors throughout the latter half of the 19th century (Graph 4). With the initial changes in the curricular conditions of access to a newly lengthened medical course that came at the end of the century, the numbers of graduates dropped from the high of 180 or so annually witnessed during the boom years of the 1890s to an average of less than 120 per year between 1905 and 1909.[15] Dentistry took its place as the institution's largest program after 1905, graduating an average of 179 young men per year at its peak between 1916 and 1921. By the end of the 1920s the numbers of students earning a Bachelor's degree in economics, education and the liberal arts exceeded for the first time the numbers graduating from the professional schools (Graph 5). As the annual numbers of Dental School graduates

15. "We were the first class to take the four years, as '95 was the last of the old three year courses, and for this reason our numbers were not as large as some of the classes immediately preceding and following. '96 was indeed very small, being composed of leftovers, men splitting their third year, and grads from other schools who desired the prestige of the Penn degree." Brooke Melanchton Anspach, M.D. '97, *Folder* (U. of P. Archives). Cf. Cheyney, *History,* 271–276. Penn was requiring one year of college for entry into the Medical School in 1908, while at Temple, less than four years of high school was sufficient. Abraham Flexner, *Medical Education in the U.S. and Canada* (Boston, 1910), 293–297.

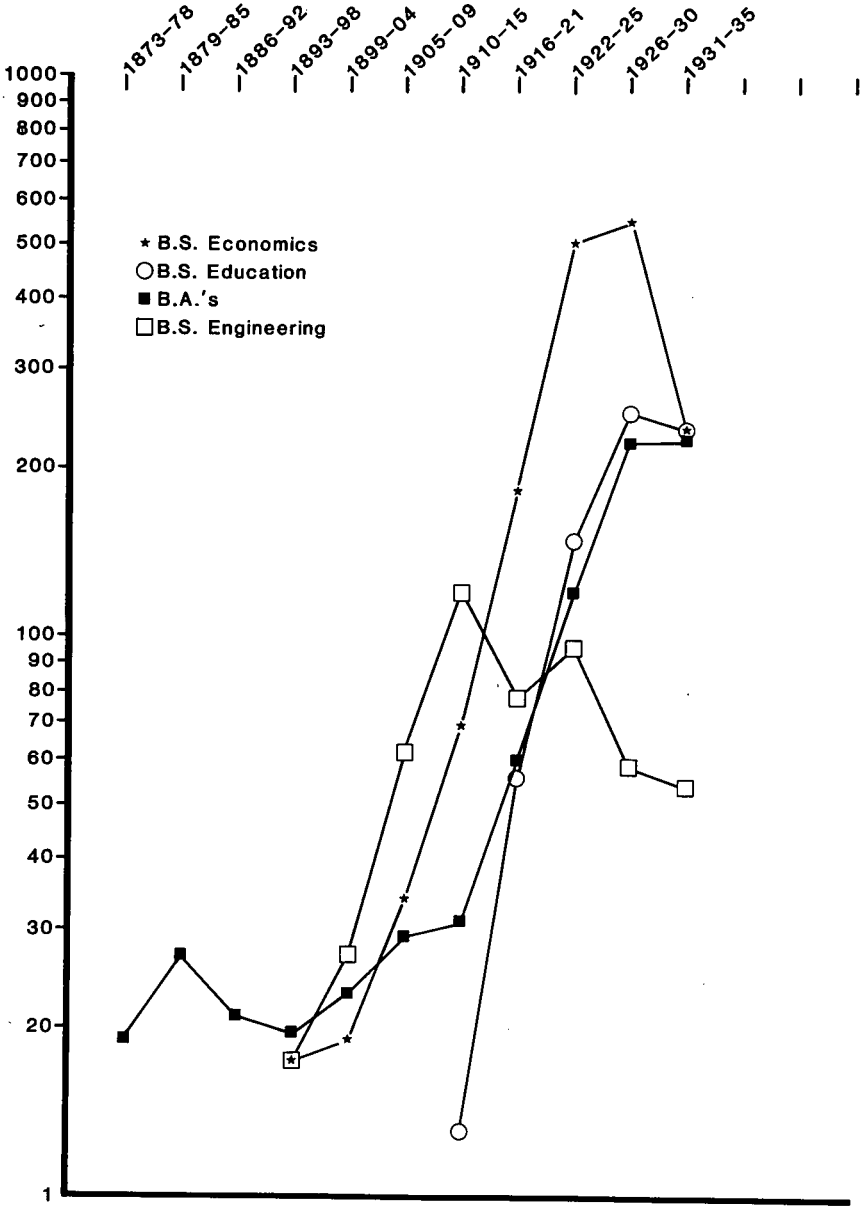
Graph 3: Projected Yearly Averages of Alumni (All Curricula) by Regional Origin, University of Pennsylvania, 1873–1935



Graph 4: Average Numbers and Kinds of Professional Degrees Conferred by Groups of Years, University of Pennsylvania, 1873–1935



Graph 5: Average Numbers and Kinds of Baccalaureate Degrees Conferred by Groups of Years, University of Pennsylvania, 1873–1935



went into decline after World War I and the Medical School commencements continued to hold steady, law alone participated in the boom that boosted the size of the undergraduate programs, allowing it to recover from its slump in the years between 1916 and 1921. By the early 1930s, law was graduating its largest classes (averaging 113 students per year), making it nearly equal in size to medicine, while the classes in dentistry had declined to an average of 78 students per year, smaller than they had been in nearly 40 years.

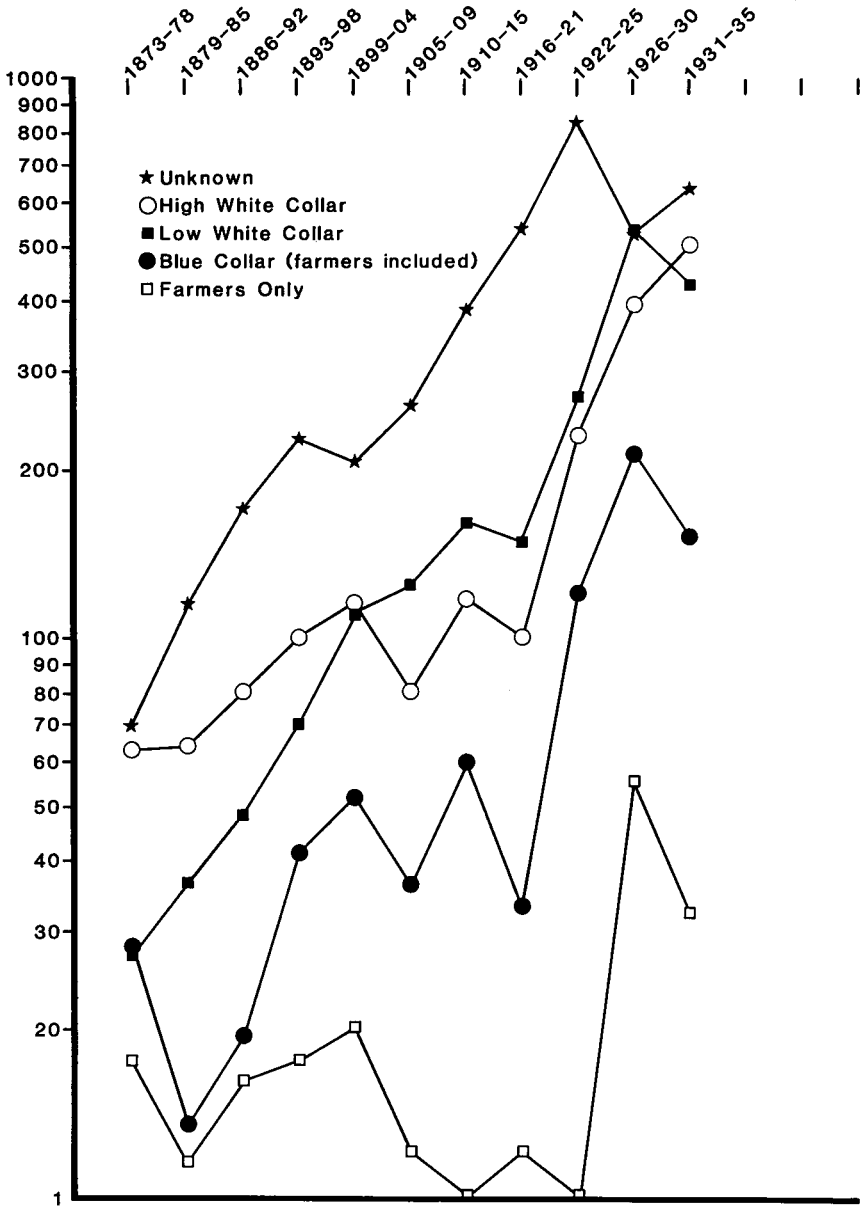
Just as the timing and magnitude of changes in scale varied from curriculum to curriculum, different curricula also participated to different degrees in the general trend toward recruitment that was more broad-based geographically. The professional curricula were the more cosmopolitan generally, although even here there were some noteworthy variations. With the exception of a cluster of years around the turn of the century, Philadelphians were always the smallest contingent among the alumni of the Medical School, but they were almost uniformly the largest representative group among the graduates of the Law School. Dentistry, on the other hand, was the most *international* in character. Among the baccalaureate programs, the Wharton School's B.S. in Economics was by far the most cosmopolitan, while the College and the Towne Scientific School remained relatively local in character throughout the period. It is not without interest, however, that the 1920s and 1930s saw an increasingly large number of young men from other states come to Penn for the B.A.[16]

Social Class Origins:

If the University of Pennsylvania generally grew larger and more cosmopolitan between 1873 and 1935, the institution also became more bourgeois (Graph 6). The growth and accompanying transformation in the social class origins of the student population took place in three stages. Leaving aside that disconcerting peak of unknowns for the moment, the first of these periods covers the last 25 years of the 19th century. Students whose fathers were small businessmen, clerks or salesmen, managers and the like ("low white collar") were just about as numerous as the sons of farmers and skilled artisans in the 1870s, each accounting for slightly less than one quarter of the alumni in the sample between 1873 and 1878. The remaining one-half of the alumni in those years were the sons of attorneys, physicians, ministers and entrepreneurs ("high white collar"). In the 1880s and 1890s, however, the number of boys whose fathers were working in low white collar occupations increased absolutely and as a percentage of the whole as the sons of farmers and skilled artisans (and a few semi-skilled and unskilled workers) dropped off precipitously. Although the numbers of blue collar sons recovered by the 1890s, exceeding their numerical representation 20 years before, they only accounted for 19% of the graduates in the last decade of the 19th century.[17]

16. On Dentists, *Ibid.*, 270.
17. The occupational classification scheme used here is a modified version of the one found in Stephen Thernstrom, *The Other Bostonians: Poverty and Progress in the American Metropolis, 1880–1970* (Cambridge, 1973), Appendix B. High White Collar here represents the liberal professions (e.g., medicine, law and the clergy), other professions (e.g., engineering, dentis-

Graph 6: Projected Yearly Averages of Alumni (All Curricula) by Fathers' Occupations, University of Pennsylvania, 1873–1935

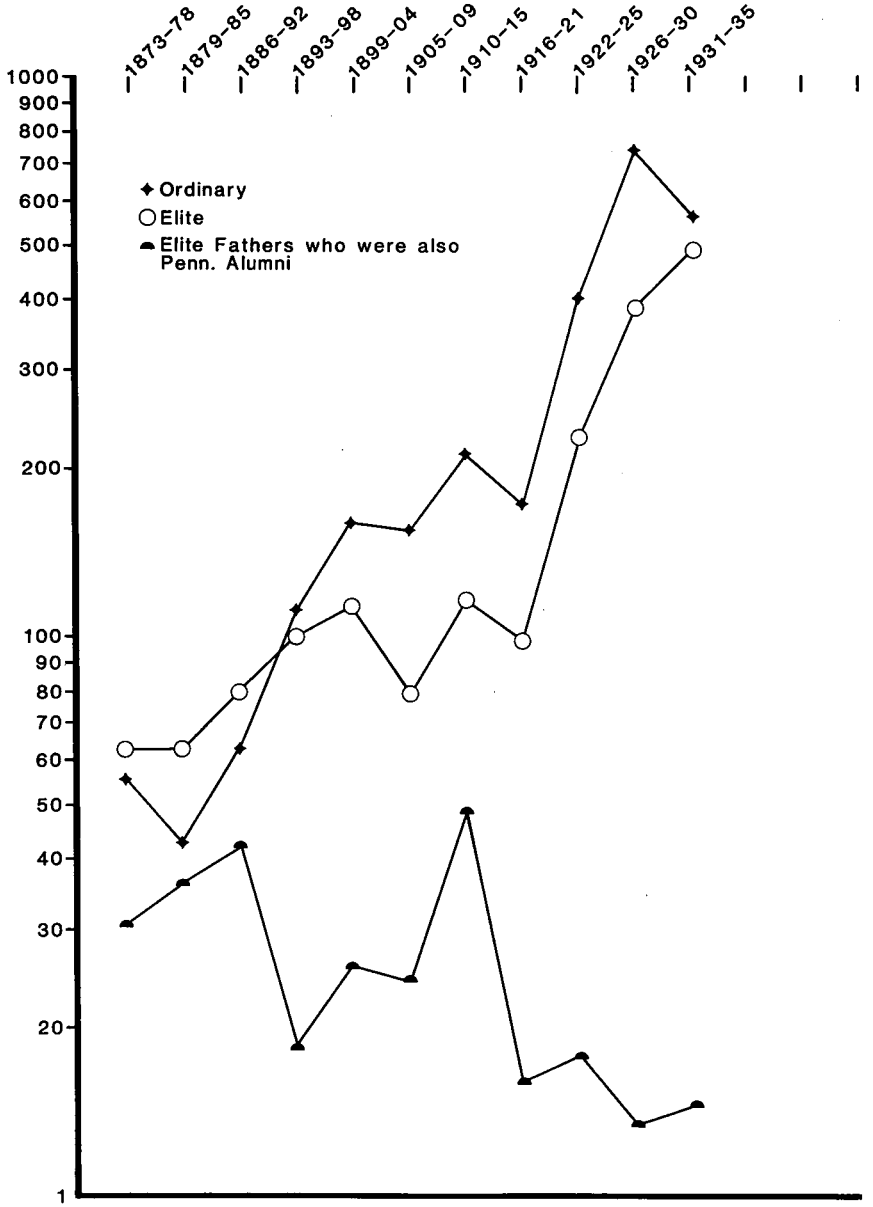


The second period extends through roughly the first 20 years of this century. The numbers of sons from liberal professional families fluctuated in those years around their late-19th-century levels, just like the numbers of those from working class or farming backgrounds. But the numbers of students who could be classified as originating in low white collar households continued to grow, outstripping those from professional or wealthy business families for the first time. The decade of the 1920s, characterized by the dramatic increase in each of these crude occupational categories, marks the beginning of the third period. Even farmers' sons, conspicuous in their absence since the turn of the century, began to return. This period concludes with the early years of the Depression when the number of alumni from professional families alone recovered dramatically. As representatives of the other occupational categories declined, the numbers of alumni from professional families surpassed (if only slightly) the numbers of young men from low white collar households for the first time since the turn of the century.

Additional information underscores these earlier conclusions (Graph 7). If all of the alumni in the sample are divided into two groups—"Elite" (*viz.* the sons of wealthy entrepreneurs, physicians, attorneys and ministers) and "Ordinary" (everyone else)—the three periods displayed in Graph 6 still emerge, although it seems that the influx of ordinary students in this period began already in the 1890s. More interesting and more telling is the lowest line on the graph representing the projected yearly averages of graduates whose fathers were *themselves* University of Pennsylvania alumni and/or appeared in the Philadelphia Social Register. Apparently there was an unusually large number of alumni sons and social register types at Penn at two points in the 63-year period. The first, when Penn probably felt more like an aristocratic preserve than at any other moment in its modern history, came in the late 1880s and 1890s. The second came some 24 years later in the years between 1910 and 1915. Though the projected yearly averages of alumni who were from prosperous white collar households were comparable in the classes graduating betwen 1899 and 1904, say, and between 1910 and 1915, the latter cohort counted perhaps twice as many social register and alumni families among their number as the former. When the boom came to Penn after the War, the Philadelphia gentry and the sons of the University's alumni apparently did not participate, as their numbers fell to the lowest point in the entire period. This social transformation of Penn's student population which entailed both a steady increase in the number of boys from ordinary household, and an almost equally steady erosion of institutional allegiance among late-19th-century alumni in general and proper Philadelphia in particular, did not go unnoticed. The socially distinguished alumni who remained faithful to Penn fought what proved to be an unsuccessful rear-guard action to preserve the school of the late 1880s as they remembered or imagined it. Under the slogan "Education for Leadership" they lobbied throughout the 1920s to reduce Penn's curricular variety and its social heterogeneity—a campaign which climaxed with the purchase of acreage for a new campus

try) as well as executives and entrepreneurs. The Low White Collar category includes petty proprietors, clerks and salesmen, as well as minor officials and supervisors. The difference between "entrepreneur" and "petty proprietor" posed some difficulties due to limitations in the data. When in doubt, the "lower" petty proprietor category was used.

Graph 7: Projected Yearly Averages of Alumni (All Curricula) from 'Ordinary' and 'Elite' Backgrounds, University of Pennsylvania, 1873–1935



well beyond the city limits in Valley Forge. This land was offered to the Board of Trustees, but the Board rejected the alumni proposal as unfeasible.[18]

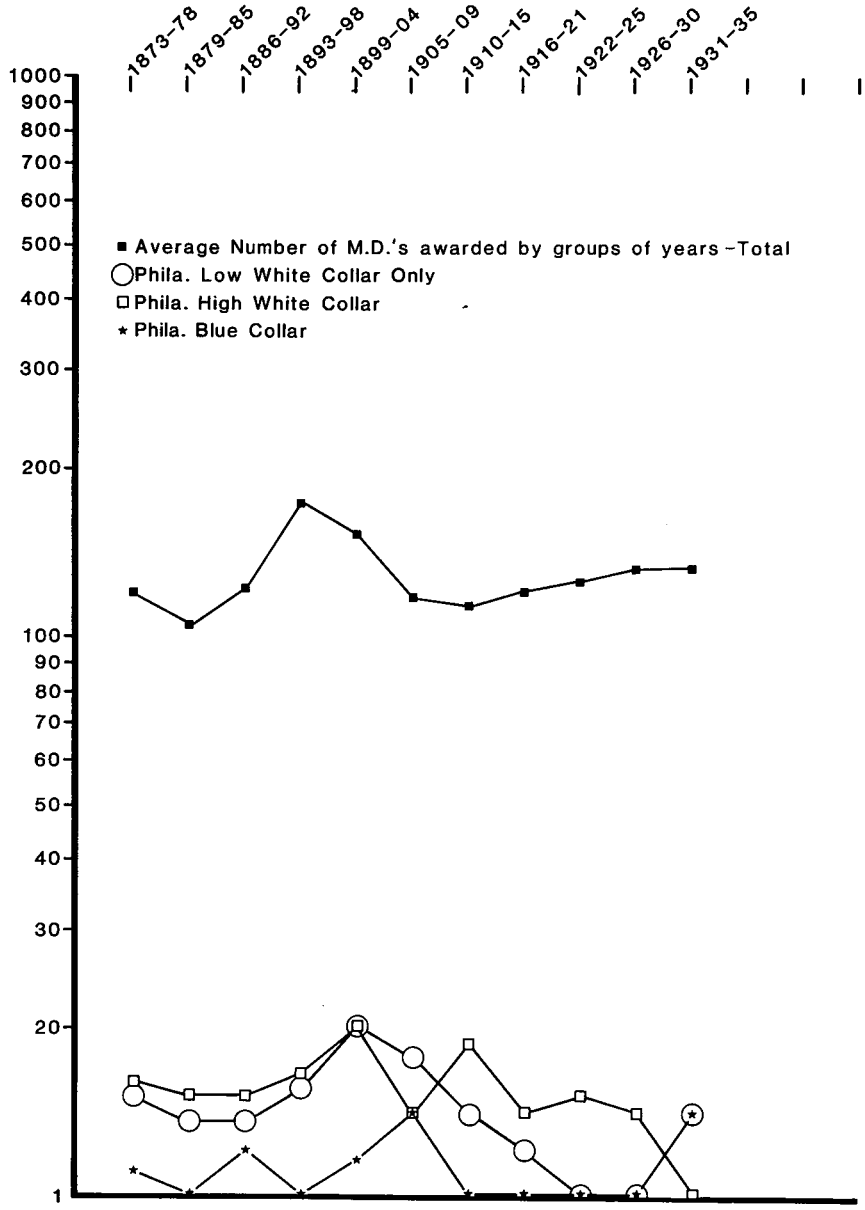
The timing and the magnitude of the transformation in the socioeconomic cast of the alumni also varied from curriculum to curriculum. Because of limitations in the data, this variation can be suggested by noting the changing class composition of the Philadelphia contingent alone. The sample argues, for example, that the smaller Philadelphia representation at the Medical School was more homogeneous and more rarefied socially than its larger Law School counterpart, being drawn more regularly from the city's entrepreneurial and professional families (Graph 8). Running counter to the general university trend toward the increasing and eventual numerical dominance of young men from ordinary households, those among the medical alumni whose fathers could be classified as working at low white collar occupations began to fall off regularly after the turn of the century. The declining numbers of representatives of this group, along with the virtual absence of young men from working class backgrounds, after reaching the peak of their numerical representation between 1905 and 1909, suggests that if indeed there were boys from ordinary families to be found at Penn's Medical School between 1910 and 1930, they were probably not from Philadelphia. Furthermore, and once again marking a departure from the university-wide picture, the number of sons from professional and entrepreneurial families did not increase during the early years of the Depression but fell off to its lowest point in 63 years, while young men from more ordinary backgrounds became more numerous than they had been for a generation or more.

In the 1930s the Law School apparently experienced a similar increase in working class representation, one accompanied by a decline in the number of sons from professional families (Graph 9). But for the most part it was the non-professional middle class whose sons swelled the rolls of the Law School, so much so indeed that here the three stages in the social transformation of the Penn alumni more generally were blurred. Well-represented almost from the very beginning, in terms of yearly averages their numbers increased from 13% (about 59% of the total from the city) in the 1880s and early 1890s to around 40% in the late 1920s (about 71%). All the while the numbers of sons from professional families held steady at less than ten per year, a total established in the 1870s. Unlike the Medical School, which saw virtually no working class students from the city between 1893 and 1930 (with the exception of a flurry of activity around the turn of the century), the Law School apparently continued to see three or four per year in the classes between 1899 and 1915. As in medicine, these working class students disappeared just before World War I. But they returned in the late 1920s, equaling in terms of yearly averages the contingent of sons from Philadelphia's professional families in the Law School and (since it was so much more cosmopolitan in terms of regional recruitment) in the Medical School as well.

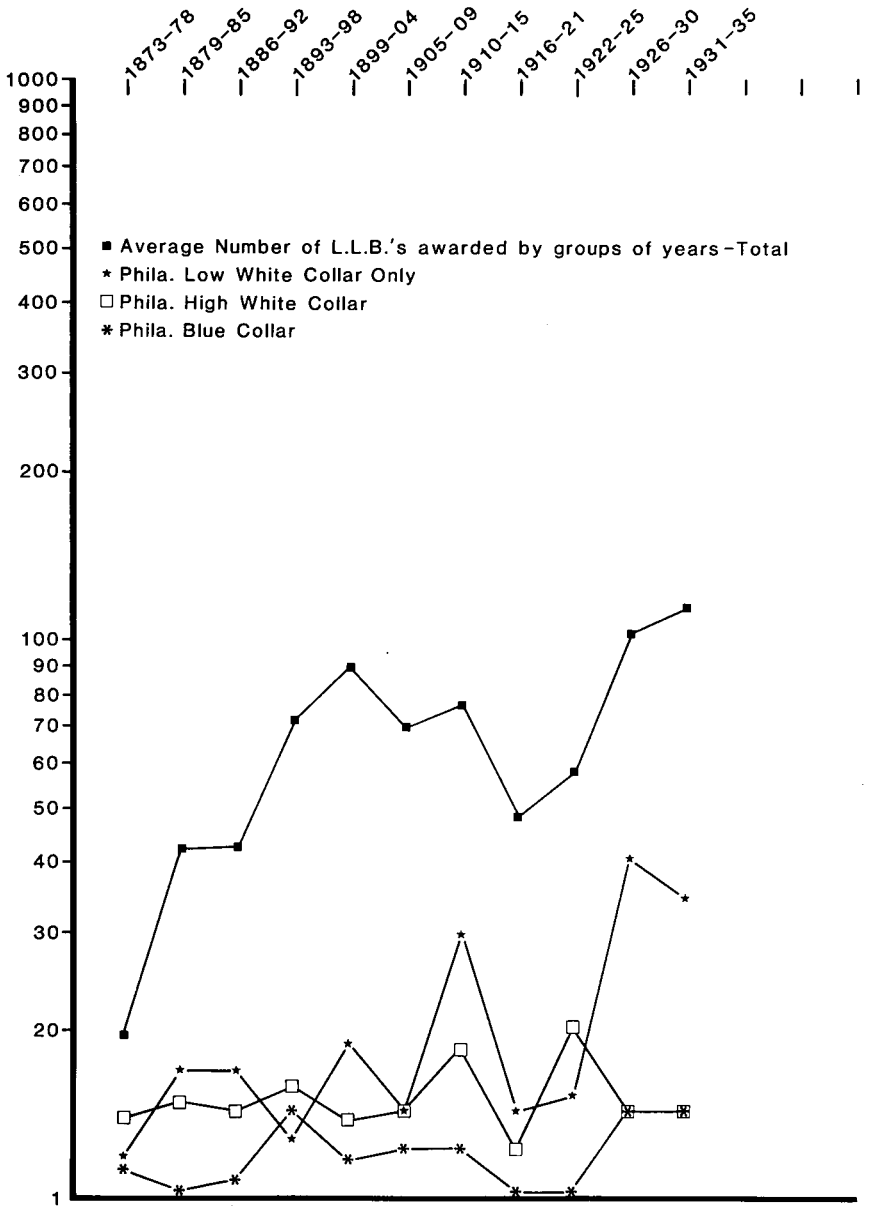
For the social class background of the city alumni who earned undergraduate degress in the College and the Wharton School, the more general three-stage pattern seems to hold (Graph 10 and 11). In both cases the numbers of young men whose fathers could be classified as working at low white collar occupations fell behind the number of sons from professional families for the first 25 years of the period and

18. Cheyney, 383-397.

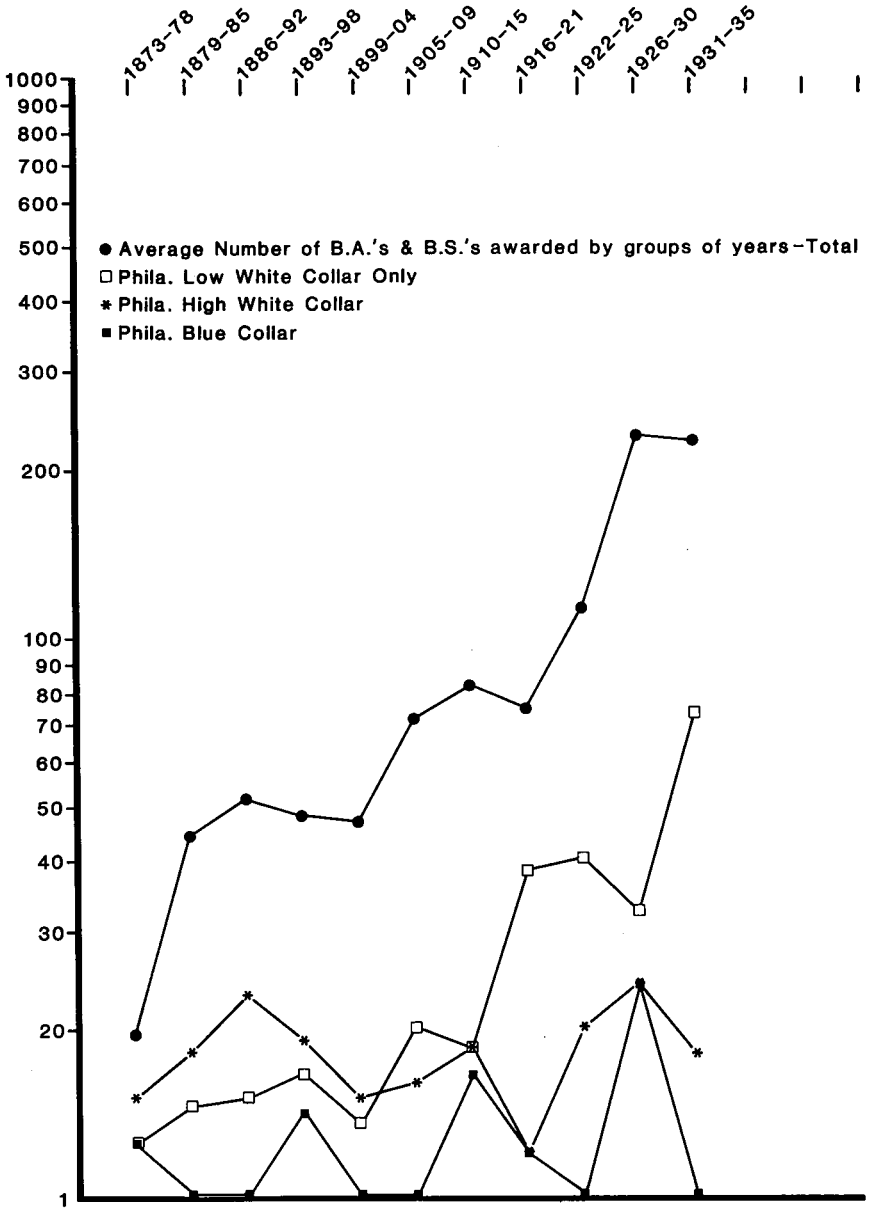
Graph 8: Projected Yearly Averages of Medical School Alumni by Fathers' Occupations, Philadelphians Only, University of Pennsylvania, 1873-1935



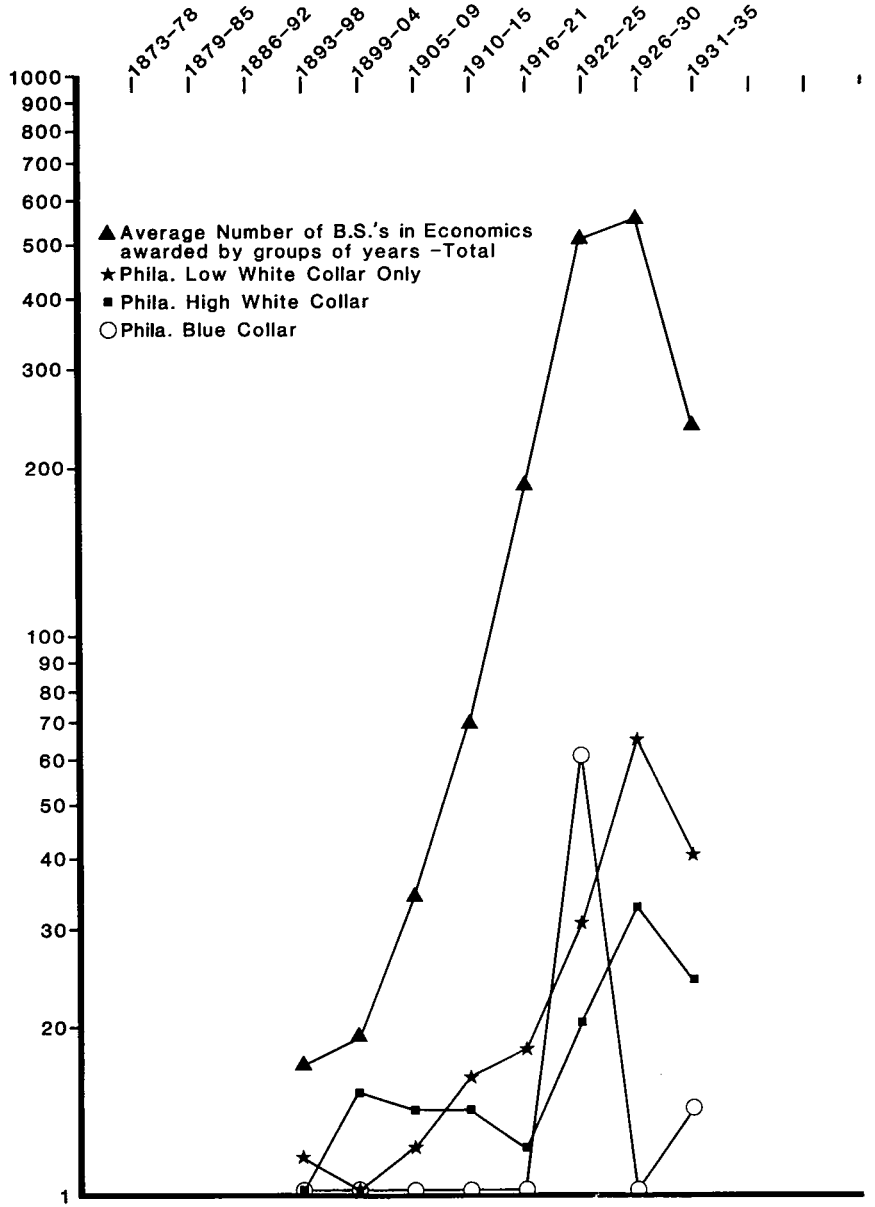
Graph 9: Projected Yearly Averages of Law School Alumni by Fathers' Occupations, Philadelphians Only, University of Pennsylvania, 1873-1935



Graph 10: Projected Yearly Averages of College Alumni (B.A.'s and B.S.'s Only) by Fathers' Occupations, Philadelphians Only, University of Pennsylvania, 1873–1935



Graph 11: Projected Yearly Averages of Wharton Alumni (B.S. in Economics) by Fathers' Occupations, Philadelphians Only, University of Pennsylvania, 1873–1935



then superceded them. After slackening, boys from both groups showed up in increasingly large numbers after the war, although the low white collar contingent apparently remained the largest. The pattern of blue collar representation in these curricula departs from the rest, however. There is presence, decline and reemergence in the College, no steadying as in law, but clusters of high concentration that punctuate the period between 1910 and 1915 and again in the early 1920s, each one larger than the last. Strangest of all, the sample argues that at Wharton, boys from blue collar households were numerous for one moment only in the early 1920s, a time when they exceeded the representation of *both* white collar groups. The Towne Scientific School's Engineering program also stands out as something of an anomaly. Local in character, and the only baccalaureate program in decline during the 1920s, the sample shows an unusually strong presence of boys from skilled artisan backgrounds during the boom years immediately preceding World War I, and once again during the early 1930s. The largest wave of young men from entrepreneurial or professional backgrounds, at least among the Philadelphia contingent, did not come until the early 1920s, almost as if they took the place of the working class boys who were there a decade before.[19]

Student Structures During the 1920s and 1930s:

Though suggestive, these diachronic representations of the transformation in the sources of regional recruitment and social origins of the Penn alumni remain limited and uncomfortably abstract. This difficulty can be overcome first by considering the Penn alumni who graduated in the 1920s and 1930s synchronically, noticing not only their fathers' occupations or their home towns, but their scholastic routes to the university, their religious affiliation and their ages. Second, the Penn patterns can be compared with the regularities among Temple's alumni in law, medicine and the rest during the same period.

The tactic to achieve this strategic aim borrows from linguistics.[20] Each of the curricular possibilities available at Penn and Temple during the 1920s and 1930s is analogous to a sentence. Each displays, that is, not only some meaningful units—a grammar, if you will—but rules of combination for these units, or a syntax. If we understand the grammatical elements as distinctive and recurring clusters of variables (e. g., "Philadelphia-born—Jewish—Public School—Penn Undergraduate, Wharton—LLB") and syntax as simple proportions, a reasonably well-delineated sense of what "discordant elements" contributed to the social heterogeneity at Penn as well as Temple should emerge. This procedure should lead to a more concrete appreciation of what the relevant practical limits on concepts like "rarefied," "distinguished," "ordinary," "local" and "cosmopolitan" looked like in this period. Although some curricula display grammatical elements found in no other, and the syntax almost cer-

19. On the social class backgrounds of engineering students more generally, cf. Noble, 36-39.
20. Cf., John G. Blair, "'What's American About America?': A Structuralist Approach," in *Prospects: An Annual of American Cultural Studies,* Jack Salzman, ed., Vol. 5 (New York, 1980), 1-16.

tainly changes from one curricular instance to another within the same institution or between institutions, there is enough commonality to warrant examining one curriculum in detail. If for no other reason than the fact that the "Philadelphia Lawyer" enjoys almost mythical status in the national imagination, or at least he once did, it is best to begin with the University of Pennsylvania's Law School.

At least four elements were essential to the grammar of social heterogeneity at the Law School between 1922 and 1935. There were Jewish young men, first of all, who for the most part were born and raised in the city of Philadelphia itself and were, like the majority of their classmates, 24 or 25 years of age upon graduation.[21] The sons of small businessmen of one sort or another (e. g., druggist, men's furnishings, paper mill supplies, accountant, contractor) were by far the most common, outnumbering the combined representation of the sons of tradesmen who depended upon some form of scholarship aid, and the sons of more wealthy executives who did not. Like the overwhelming majority of their fellows, these Jewish students went to public school. Whether their father was a paper-hanger or a retail businessman, they were much more likely to have attended Central, the city's all-male high school for the academically talented, than their Protestant classmates.[22] An undergraduate degree from Penn, often from Wharton, completed their scholastic route to the Law School.

The three remaining grammatical elements differentiate within the large group of Protestant young men who accounted for the majority of the Law School's alumni in this period. First, there were those who were socio-economically indistinguishable from the majority of their Jewish classmates. Whether they grew up in Philadelphia or any one of a number of South Jersey communities, they too attended public school and earned undergraduate degrees at Penn before matriculating at the Law School. The Philadelphia gentry who made their homes in Chestnut Hill or one of the fashionable communities along the Main Line comprise the second element. Social Register listing is not essential, but their fathers' professional or corporate executive background is; and even more important, a pattern of preliminary education inaugurated in a private school locally or in New England, and concluded with an A.B. earned at an institution other than Penn like Harvard, Princeton or Haverford. Finally, there were the sons of notables from Pennsylvania's small cities like Reading, Scranton or Erie (populations in excess of 100,000 in 1930), or at least from good-sized towns like Altoona, Allentown (80,000–90,000) or Lancaster (53,000). Whether their father was a judge, a restauranteur or a manufacturer, these students attended public school locally, and arrived on the steps of the Law School with liberal arts degrees in hand from the small private colleges that dot the Quaker State—schools like Gettysburg, Dickinson, Bucknell, Allegheny, Albright, Muhlenburg or Lafayette.

How were these elements distributed? Jewish Philadelphians accounted for roughly one-half of the city's representation at the Law School, and 31% of the

21. I leave aside here the conceptual difficulties of what is and what is not "functional" to a grammar. See also J. Culler in *Structuralist Poetics: Structuralism, Linguistics and the Study of Literature* (Ithaca, 1975), 1–31.

22. Of the 17 Philadelphia alumni in the Law School sample who graduated between 1922 and 1935, 10 were Jewish. Five of these students attended Central before coming to Penn, whereas none of the remaining Philadelphians (6 Protestants, 1 Catholic) had.

classes as a whole. Those ordinary Protestant young men who, like their Jewish classmates, held Penn undergraduate degrees amounted to about 25% of the alumni, only slightly less than the proportional representation of the Provincial Elite (28%). Fashionable Philadelphians were, as we might expect, the smallest group of all, accounting for about 15% of the alumni in this period.

These four elements were basic enough to the institution's lexicon to reappear in other curricula. But among the medical alumni and the undergraduates at Wharton and the College, their syntactical significance changes. Jewish Philadelphians, for example, not only amounted to over one-half of the city's representation in the Law School classes during the 1920s and 1930s; they also accounted for roughly one-half of the much smaller city contingent (23 students per year) in the Medical School. The character of the much larger city contingents among the undergraduates, on the other hand, was tilted conspicuously toward Jewish students in the College, toward Protestants in the Wharton School. Chances were seven out of ten that a city boy found in the College was Jewish. In the Wharton School, by contrast, chances were equally good or better that a young man was *not* Jewish.[23] Each case involves a city contingent larger than the *total* number of L.L.B.'s graduating annually—about 110 students per year from the College, about 180 per year from Wharton.

These enlarged city contingents among the undergraduates were composed of grammatically "ordinary" Jewish students and "ordinary" Protestants, since the sons of Philadelphia's gentry were customarily sent elsewhere for their undergraduate years. The few who fit the "Protestant Establishment" profile well enough, save that unlike so many of their peers they came to Penn after attending private school, accounted for four percent of the College's alumni in this period. At Wharton their presence was all but undetectable.[24] On the other hand, fashionable Main Line Philadelphians were indeed to be found at the Medical School, but they accounted for only seven percent of the alumni, not 15% as they did in law. The syntactical role played by the provincial elite from the state's large towns and small cities also substantially altered among the Medical School's alumni. These students virtually *defined* the Pennsylvania contingent in the Law School, but in medicine they accounted for only one-quarter of the total number of students from the Quaker State and about seven percent of the alumni overall.

Obviously some additional grammatical elements were at work in these other curricula. Two particularly stand out among the medical alumni. Pennsylvania's rural Protestants comprise the first group, young men who hailed from communities like Minersville and Ashland whose populations ranged between 5,000 and 10,000, or from villages half that size or smaller like Brownsville, Ringtown, Greenock or Coraopolis. These students did not make their way to the State University or to a small denominational college upon completion of their public school education locally,

23. Wharton was the only quarter of the University where Catholic students from the city could be found in numbers exceeding Jewish Philadelphians, accounting as they did for at least 18 percent of the city contingent (N = 38) between 1922 and 1935.

24. Of the 70 students in the sample who earned a B.A. at Penn between 1922 and 1935, only three fit the prototypical "Protestant Establishment" background made famous by E. Digby Baltzell and G. William Domhoff. Only one appeared among the 166 sampled Wharton alumni.

but came to Penn for an undergraduate degree before matriculating in the Medical School. At best a negligible presence among the law students, rural Pennsylvanians accounted for the bulk of the state's representation among the medical students and for about 20% of the alumni overall. Second, there were transfer students, distinctive because they had *already* completed two years of medical training (as well as their undergraduate work) at institutions like Dartmouth, Wisconsin, North Carolina, Utah or Wake Forest before coming to Penn. Nearly one-half of the medical alumni were from states other than Pennsylvania, with the Southern and Midwestern regions of the country contributing the largest shares. Transfer students accounted for one-half of those from other states, and for about 25% of the total number graduating annually. These two elements are probably sufficient to distinguish the social character of the medical alumni from their Law School counterparts, but there is one additional detail worth noticing: running across both of these groups, though not essential to either, was a greater range of age than in the Law School, since 30% of these were 27 years old or older upon graduation.[25]

Two further elements—the Jewish and Protestant students who came to Penn from other states—round out this picture of the social heterogeneity among the undergraduates. Home town origins and religious affiliation aside, there is nothing to differentiate them from their Philadelphia counterparts. It might be reasonably assumed that the outsiders as a group were more well-off than the locals, if only because their families bore the additional expense of room and board, but the data tells us little: public school educations and fathers who did not work with their hands were the order of the day.[26] And just as the local clientele who patronized Wharton and the College was sharply divided along a religious axis, so too were those who brought their custom from beyond the borders of the state. The example of New Jersey and New York, the regional source of the largest single concentration of outsiders at Wharton and the bulk of *all* outsiders at the College should illustrate the point. Nearly 60% of the students from this area who graduated from the College between 1926 and 1935 were Jewish. (Given this influx and the character of the city contingent, we can estimate that nearly every other student graduating from the College was Jewish in the years just before the Depression.) By contrast, only 28% of the much larger New York and New Jersey contingent at the Wharton School was Jewish.

In contrast, Temple was far more local in character than the University of Pennsylvania in the 1920s and 1930s. It was also cheaper. Thus Philadelphians accounted for

25. Occupational information on the fathers of only eight of the 15 students from Pennsylvania available suggests a stronger tendency toward both institutional and occupational succession between fathers and sons than we found in the Law School. Five of these young men had physician fathers, four of whom were themselves Penn medical alumni. Cf. E. Christianson, "The Medical Practitioners of Massachusetts, 1630–1800: Patterns of Change and Continuity," *Medicine in Colonial Massachusetts, 1620–1820,* ed. by Th. Cash *et al.* (Charlottesville, 1980), 49–67.

26. "The minimum expenses for a college year is $1,000.00," the Catalogue announced in 1929–1930, with the average amounting to more like $1,250.00. Board and lodging in the early 20s in a dormitory or a boarding house cost about $360.00. By the mid 30s, those costs had risen to about $520.00.

56% of the degrees conferred overall between 1926 and 1935, and an even greater share of the certificates (60%). The vast majority of the remainder were awarded to those from other localities within the state or to students who made their homes nearby in South Jersey. Since Temple's tuition costs were roughly one-half those charged in West Philadelphia, for economic reasons, as well as less tangible but equally real social ones, Temple numbered more working class, more foreign-born, more women and more blacks among this local clientele.[27] Finally, Temple was smaller than Penn, particularly during the closing years of the 1920s. The numbers of Philadelphians alone who graduated annually with a degree from the University of Pennsylvania during the last five years of the decade equaled the total number of degrees awarded at Temple in the same period (about 566 per year). Although Temple doubled in size while Penn's figures increased only negligibly during the early 1930s, the University of Pennsylvania was still annually conferring about twice as many degrees as its neighbor in North Philadelphia.

Despite these differences of scale and ethos, however, the clienteles serviced by Temple and Penn were by no means mutually exclusive. There are cases of different individuals, grammatically indistinguishable from one another in terms of route and fathers' occupations, graduating from both schools in equivalent curricula at the same point in time. But what is more interesting here and certainly less understood is the traffic of students *between* institutions—the ways in which instruction at one regularly led to instruction of another sort later across town for the *same* individuals. What were the rudimentary grammatical elements peculiar to Temple alone and the connections, such as the route that ran *from* Penn *to* Temple?[28]

Suppose all the Jewish Philadelphians who earned a B.S. in commerce at Temple during the late 1920s and early 1930s had gone to Penn to study economics instead. Although their numbers were small (about 24 students per year between 1926 and 1930; nearly four times that many between 1931 and 1935), the syntax of social heterogeneity at the Wharton School would certainly have altered as a result, but Wharton's grammar would have remained essentially unchanged. The majority of Jewish students to be found at Temple's School of Commerce were the sons of merchants and proprietors, and, like their counterparts at Penn, born and raised in the city. About 40% of these Temple alumni claimed Central High School as their alma mater. For the rest, even if they were among the 13% of their classmates born in Russia, it was more likely to be Simon Gratz, Germantown, or West Philadelphia than Southern, the high school that serviced the city's immigrant district.

As a group, the Jewish males who graduated in education and dentistry were of a different sort, however. Roughly equal in size to the Jewish contingent in commerce alone, nearly 25% of the alumni in these curricula were foreign-born; but foreign-

27. In terms of tuition alone, a degree at Temple cost roughly half as much as one at Penn. The annual cost of instruction in the College at Temple, for example, rose from $150 in 1925 to $200 in 1935, while the Medical School's tuition increased from $200 to $250 in the same period. At Penn, however, tuition costs in the College rose from $275 in 1925 to $400 in 1935, while the Medical School increased its tuition from $333 to $500.

28. The exchange relationships of the 20s and 30s between the two institutions developed from what had been, for a few students at least, one of simultaneity at the turn of the century. In Scott Nearing, *Making of a Radical* (New York, 1972), 36.

born or not, in education and dentistry a South Philadelphia background was the rule rather than the exception. As we might expect, the sons of blacksmiths, carpenters, plumbers, janitors and the like were far more conspicuous among the merchants' sons in this group of alumni than in any of the others we have examined thus far.[29] Most of the Jewish dental alumni were 23 or 24 years of age upon graduation, a year or so older than the majority of their counterparts in the School of Education, and if their route to the Dental School regularly included instruction at institutions other than South Philadelphia, their records did not show it. About one third of the Jewish males graduating in education during the early years of the Depression were over 25, however, and for these students (working teachers already, no doubt) the standard route to Temple included not only South Philadelphia High School but two years at the city's normal school as well.

Temple's Catholic alumni were equally indicative of an institutional vocabulary different in its grammar and social accent from the one characteristic of the University of Pennsylvania. Although they accounted for only about 13% of the institution's degree recipients overall between 1925 and 1935 (Table 1), Catholics were still more visible by far at Temple than they were at Penn. About half of these students made their homes in small-town Pennsylvania, and perhaps it comes as no surprise to learn that they were educated locally in the public schools. As a rule, however, the same was true of the Catholic students who resided in Philadelphia, despite the city's well developed network of parochial schools. One might expect that father's occupation or curricular destination might help differentiate within the Catholic contingent where home town origin and scholastic route did not, but children of men who toiled at blue collar occupations accounted for about two out of every five of the Catholic alumni, whether they were from Mahoney City, Altoona, or Northeast Philadelphia—whether they were females in the School of Education, or males scattered through Commerce, Pharmacy, Dentistry or the College of Liberal Arts.[30]

When we turn to Temple's Protestant alumni, we face a large and socially variegated group whose representatives accounted for 40% of the institution's degree recipients overall between 1926 and 1935, and never less than 25% of the graduates in any single curriculum (Table 1). Forty percent of these Protestant students came to Temple for instruction leading to the B.S. in education, while it was the education program itself which absorbed more of Temple's instructional energies than any of its other curricular endeavors during the period (Graph 12). The College of Education offers us the first word, if not the last, on the social character of Temple's Protestant alumni, and that is "female." Those Jewish males from South Philadelphia we spoke of earlier found themselves flanked on the one side by a contingent of women

29. For the decade, 37 percent of the Jewish males from South Philadelphia found in Dentistry and Education combined came from blue collar households.

30. Dentistry stands as an exception to the rule since it alone managed regularly to attract a small number of Catholic Philadelphians who were educated in parochial schools. Medicine was also an exception, but for a different reason. In addition to the six to eight Catholic students per year among the medical alumni who made their homes in Pennsylvania, there was an even larger Catholic contingent from outside the state.

Table 1: Distribution of Sampled Temple Alumni by Program and Declared Religious Affiliation+

A. 1926-1930 (1/12)

DEGREE	TOTAL IN SAMPLE N	%	JEWISH N	%	PROTESTANT N	%	CATHOLIC N	%	??
B.A.	15	(6.3)	5		3		5		2
B.S. Ed.	72	(30.5)	7		44		9		12*
B.S. Comm.	33	(14.0)	11		13		3		6*
M.D.'s	21	(9.0)	7		7		7		--
LLB's	25	(10.6)	9		11		1		4
Pharmacy	30	(12.7)	17		7		6		0
Dentistry	40	(16.9)	20		11		6		3
TOTAL	236	(100.)	76	(32.2)	96	(40.7)	37	(15.7)	27 (11.4)

*Of the 6 unknowns in Commerce, 5 were very likely Jewish. The same is true of at least 2 of the 12 unknowns in Education. That would put the total number of Jewish students closer to 83 or 35.2 percent.

B. 1931-1935 (1/20)

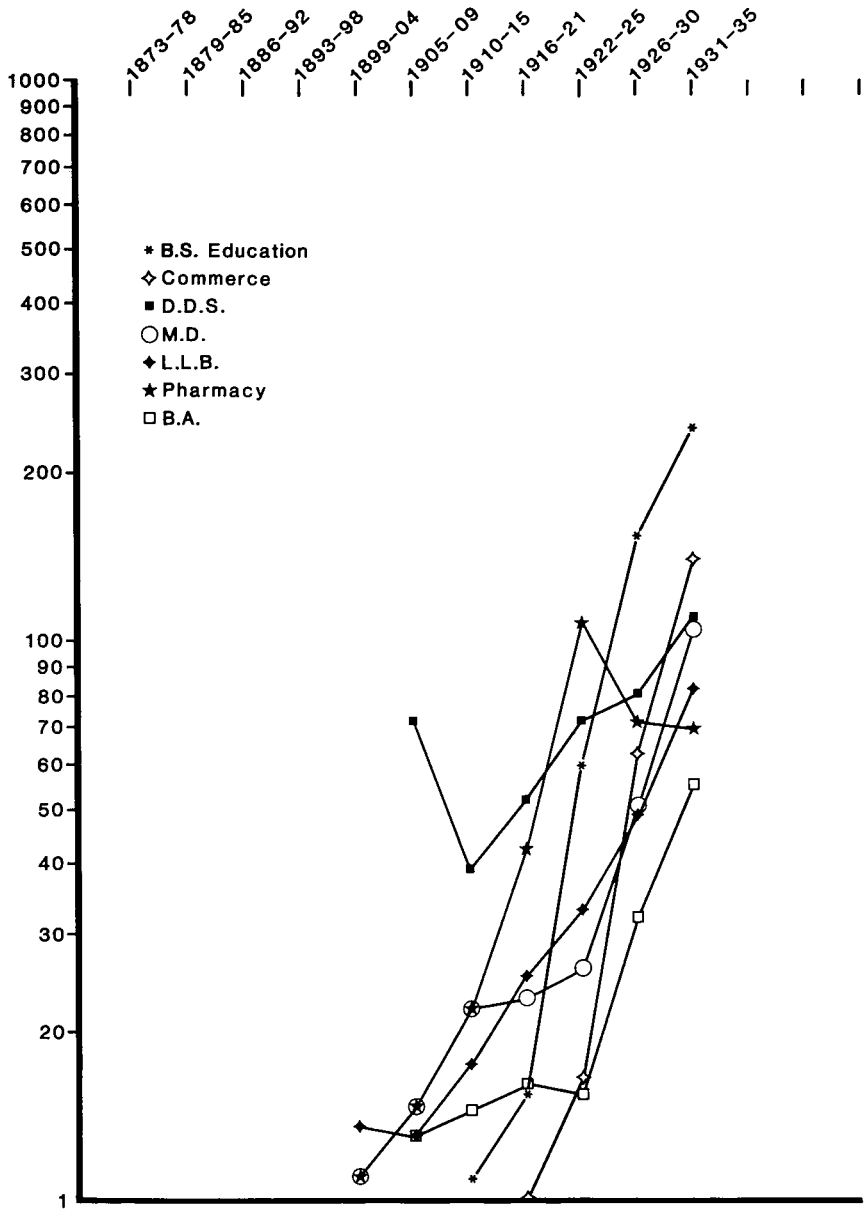
DEGREE	TOTAL IN SAMPLE N	%	JEWISH N	%	PROTESTANT N	%	CATHOLIC N	%	??
B.A.	20	(7.7)	12		5		--		3*
B.S. Ed.	88	(33.9)	22		47		9		10*
B.S. Comm.	52	(20.0)	23		22		4		3
M.D.'s	24	(9.2)	7		12		5		--
LLB's	27	(10.4)	12		11		4		--
Pharmacy	19	(7.3)	9		4		6		--
Dentistry	30	(11.5)	15		8		5		2
TOTAL	259	(100.0)	100	(38.6)	109	(42.0)	33	(12.6)	18 (6.8)

*Three of the unknowns in the B.A. program were probably Jewish, as were 4 of the 10 unknowns in Education raising the number of Jewish students to 107 or 41.3 percent.

+Graduate Students in Education and the Liberal Arts, as well as students in Chiropody and Theology are omitted.

from Presbyterian families who resided chiefly in West Philadelphia and Germantown, and by an equally large or larger group of Lutheran women from Pennsylvania towns like Lebanon, Latrob and Easton on the other. For the most part, these were not the daughters of professional men, but if they did come from professional families, their fathers were much more likely to be accountants, dentists or engineers than attorneys or physicians. Most described their fathers as proprietors, salesmen, or clerks, but no matter what their fathers' occupations, all of these women attended public school, and once again, if they were over 25, customarily rounded out their

Graph 12: Average Numbers and Kinds of Degrees Conferred by Groups of Years, Temple University, 1899–1935



preliminary education with instruction at a normal school, the State University, and occasionally, at private colleges like Theil, Bethany, or Grove City.[31]

Among the Law School's alumni we find the largest single concentration of students who came to Temple after instruction at the University of Pennsylvania. No less than one quarter of the L.L.B.s awarded annually in the late 1920s (about 60 per year), and nearly one half of the larger classes in the early 1930s (about 108 per year) went to students who had previously attended Penn. Under what circumstances they attended (as regular full-time day students in the College? College Courses for Teachers? the Wharton Extension Program?), or whether they *graduated* we cannot say. Although this route through Penn to Temple Law was more common among Jewish Philadelphians than any other single group, it was certainly not confined to them exclusively. We can estimate that 62% of the Jewish Philadelphians who graduated between 1926 and 1935 included instruction at the University of Pennsylvania in their preliminary education, but so did nearly half of the Protestant Philadelphians and about one quarter of those who came from other localities within the state. Finally, lest we forget Temple's very different center of social gravity in this period, it is worth noting that while the majority of the L.L.B.s at Penn were 24 or 25 years of age upon graduation, about 60% of Temple's Law School alumni were 27 years of age or older when they received their degrees.[32]

John Rawls reminded us some years ago, within the context of philosophical give and take over rival moral theories, that "we need to be tolerant of simplifications if they reveal and approximate the general outlines of our judgments." He pointed out: "Objections by way of counterexamples are to be made with care since they may tell us only what we know already, namely that our theory is wrong somewhere. The important thing is to find out how often and how far it is wrong."[33] Certainly Laurence Veysey's *Emergence of the American University* cannot properly be said to advance a "theory" of the transformation of the higher learning. But apart from this and other differences between historical and philosophical dispute, the University of Pennsylvania and Temple do indeed stand as useful counterexamples to the kind of coherence and emphasis represented in Veysey's work. Moreover, we would do well to take Rawls' general injunction to heart here. This means not only being circumspect in drawing conclusions from the experience of these two institutions, but also trying to point those conclusions in a particular direction. Toward that end, we can summarize our efforts under two main headings.

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31. In terms of yearly averages, the Protestant women from the city contributed about 26 students per year to the classes graduating in the late 20s, but during the early 30s their numbers nearly trebled. Approximately 30 percent of these women were over 25 when they received their degrees.
32. Chances are good that these Law alumni (who pursued their studies during the evening) did not complete work for their undergraduate degrees since no college work was required to enroll in the Temple Law School as late as 1927–1928 academic year. Penn began asking for a college degree to study the Law under its auspices as early as 1915, but it was not until 1922 that it could report 100 percent of its entering class had satisfied that criterion. See A. Z. Reed, *Training for the Public Profession of Law* (Boston, 1921), 439, as well as his *Present-Day Law Schools in the United States and Canada* (Boston, 1928), 490–492.
33. John Rawls, *A Theory of Justice* (Cambridge, 1971), 52.

1. The Undergraduate Curriculum in 1890 and 1930

There are at least two anachronistic simplifications with which *The Emergence of the American University* has purchased its persuasiveness; the first of these centers on the structural matter raised in the opening section of this essay. Should the baccalaureate portion of the American university's total instructional endeavor be used, as Veysey does, to stand for the whole at the end of the 19th century? It should not, because the Bachelor's curriculum *became* central to the formal educational experience of everyone who sought university instruction only in the years following World War I. The baccalaureate's new-found pre-eminence as gateway to the university was the result of the recasting of the institution's formal character as an ensemble of instructional possibilities. At least in part, this recasting depended upon sealing off the old 19th century routes to professional curricula which had allowed students to circumvent not only the Bachelor's degree but the high school diploma as well.

This initial structural point must be qualified. If the use of the Bachelor's degree to stand for the whole of the late 19th century university misleads because it presupposes one of the results of the transformation of the higher learning that occurred after World War I, we need to be wary of the Bachelor's analytic usefulness for the period thereafter in our efforts to come to terms with the social variety of the American student population. By the 1920s, even within a single institution, the social composition of one curriculum is no reliable guide to the social composition of those adjacent to it or above it. We would not have anticipated the predominantly Jewish character of the College if we had examined Wharton alone, nor the social valences peculiar to the alumni from the Law School and the Medical School if we had simply confined our attention to Penn's undergraduates. The fact that these difficulties are compounded when we examine more than one institution simply underscores the point.

2. The Distinguished Institutions and the Rest

The second simplification at the heart of *The Emergence* parallels the first: just as Veysey relies on the undergraduates to represent university instruction in its entirety, he also uses distinguished institutions like Harvard, Yale, Princeton and Cornell to stand for the array of American collegiate and university establishments at the end of the 19th century. If the example of Temple and Penn under our first heading invites us to question our conceptualization of the relationships between one kind of instruction and another, here their example counsels us to pose questions about the relationships between one institution and another. Let us think of these relationships collectively as a market of educational services which Veysey characterized as part of "the price of structure," comprised exclusively of "contenders for high institutional honors."

During the nineties in a very real sense the American academic establishment lost its freedom. To succeed in building a major university, one now had to conform to the standard structural pattern in all basic respects—no matter how one might trumpet one's few peculiar embellishments. A competitive market for money, students, faculty, and prestige dictated the avoidance of pronounced eccentricities. Henceforth initiative had to display itself within the lines laid down by the given system.

When Veysey points to the relevant lineaments of this system, it is the extrinsic feature of university organization which impresses him the most. "Consider the inconceivability of an American university without a board of trustees," he writes, without "department chairmen, athletic stadium, transcripts of student grades, formal registration procedures, or a department of geology."[34]

That cross-hatched variety of scholastic routes we found among the Penn and Temple alumni challenges us first of all to conceive of market relations across a wider spectrum of institutions, for the market included not only the Penns but the Temples; not only colleges and universities, but secondary schools as well. Their experience also prompts us to conceive of market relations intrinsically and more dynamically. That is, we need to understand the permissible modes of curricular exchange in their variety, horizontal as well as vertical, and who in the population negotiated them. But we also need to understand how the incentives and the costs of these negotiations changed over time for individuals as well as for society as a whole. The United States did not face a "drop-out" problem prior to World War II, for example. Why not? If completing grade twelve was still an opportunity for most young Americans in 1930, why had it become an ultimatum by 1960? Wouldn't the *attainment* of a degree itself be more valuable in the 1920s than *how* one attained it? Is that still true today when an unprecedented proportion of the age cohort goes on to some form of post-secondary education? We shall never understand this market until we begin to pose questions about it. Until such time, we shall continue to follow changing participation rates as the eye might follow sliding rocks and never feel the avalanche.[35]

34. Veysey, 340.

35. These questions are discussed in detail in Green, *Predicting the Behavior of the Educational System*, 90–113. The concluding metaphor is borrowed from W. H. Gass, "The Imagination of an Insurrection," *Fiction and the Figures of Life* (Boston, 1971), 263.

Part Four: The Process of Professionalization

Arthur Engel

The English Universities and Professional Education

Professional education was the primary function of the medieval universities throughout Europe. The Higher Faculties of Law, Medicine and Theology were intended for this purpose and the Arts Faculty was only conceived as preparation for study in these Higher Faculties. At the time of the Renaissance, however, the influx of laity into the universities, influenced by the new secular ideal of the *virtuosi* had the effect of altering these ideals. In England, the Reformation also rendered the Civil and Canon Law taught in the universities obsolete. Furthermore the establishment of endowed colleges tended to have the effect of insulating the universities from the necessity of catering to student needs or the powers of the State in order to maintain their incomes. As a result, a new concept of "liberal education" developed which was deliberately non-professional. It rested upon the traditional Arts subjects of classical languages and literature and pure mathematics, but instead of viewing these as stepping stones to the higher professional faculties, they became ends in themselves. It was argued that the primary need of the educated gentleman was for a training which would discipline and cultivate the mental faculties. The practical content of the education became distinctly less important as the disciplinary value increased in importance.

During the 19th century the notion of the unique suitability of classical studies and mathematics for "liberal education" was abandoned. Scholars in other disciplines were successful in gaining acceptance for the view that the study of any abstract scholarly subject in sufficient depth would provide the needed intellectual discipline.[1] The antiprofessional spirit, however, remained as the most important hall-

1. On this subject, see Sheldon Rothblatt, *Tradition and Change in English Liberal Education* (London, 1977). This broadening of the curriculum was also important in that it provided the flexibility which allowed "liberal education" to be viewed as sufficient training for those occupations, such as the Civil Service, in which university influence was especially strong. See, Ray Jones, *The 19th Century Foreign Office: An Administrative History* (London, 1971). Also see J. M. Compton, "Open Competition and the Indian Civil Service 1854-1876," *English Historical Review,* 327 (1968), 265-84. Also R. J. Moore, "The Abolition of Patronage in the Indian Civil Service and the Closure of Haileybury College," *Historical Journal,* 7 (1964), 246-57. Also, C. J. Dewey, "The Education of a Ruling Caste: The Indian Civil Ser-

mark of "liberal education" and university study. John Stuart Mill summarized this view in his rectoral address to the University of St. Andrews in 1867:

> The proper function of an University in national education is tolerably well understood. At least, there is a tolerably general agreement about what an University is not. It is not a place of professional education. Universities are not intended to teach the knowledge required to fit men for some special mode of gaining their livelihood. Their object is not to make skillful lawyers, or physicians, or engineers, but capable and cultivated human beings .... Men are men before they are lawyers, or physicians or merchants, or manufacturers; and if you make them capable and sensible men, they will make themselves capable and sensible lawyers or physicians.[2]

The System of Professional Apprenticeship:

Since the universities had abdicated the role of professional education, systems of apprenticeship tended to take their place in the traditional learned professions. Physicians "walked the rounds" in hospitals, lawyers served under articles and ate their dinners at the Inns of Court, clergymen took curacies while waiting for benefices of their own. Of course, this *ad hoc* solution did not have to wait long for intellectual justification. It soon came to be urged that the practical nature of these programs of professional education marked their superiority to mere literary or theoretical instruction. In all of the learned professions, a strong anti-abstract bias developed. The clergyman must be indistinguishable from an ordinary gentleman except for his black coat, the lawyer must look to his precedents and the physician to his clinical cases. It came to be argued that the particular genius of English professional life was its freedom from the narrowness, pedantry and unreality which plagued more formally educated professional communities. The higher faculties atrophied completely as educational institutions and remained only to grant the honorific distinction of doctoral degrees to those who had obtained their training elsewhere. In fact, they even gave up testing that practically acquired knowledge and often merely granted their degrees to arts graduates of the requisite number of terms beyond the bachelors degree who had submitted to purely formal exercises and paid the required fees.

The only other connection which remained between the universities and the professions was the fellowship system, whose purpose had always been primarily to support arts graduates during their professional training. With the decline of the educational function of the higher faculties, the fellowships came to be used to support graduates away from the university until they had established themselves in professional life. Since most fellowships required the taking of holy orders and all the colleges of Oxford and Cambridge held church livings which were offered to the fellows in order of seniority, most college fellows became clergymen, but a few used their fellowship incomes to support themselves while preparing for careers at the bar or in medicine.[3]

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vice in the Era of Competitive Examinations," *English Historical Review*, 88 (1973), 262–85.

2. Reprinted in *James and John Stuart Mill on Education*, F. A. Cavenagh (ed.) (Cambridge, 1931), 133–34. Cited in Sheldon Rothblatt, *Revolution of the Dons* (New York, 1968), 248.
3. An argument in favor of their retention for this purpose continued to be made throughout the 19th century. When Benjamin Jowett prepared his memorandum on university reform in

This English system was never without its critics. Neither on the Continent nor in Scotland did the universities give up their role in professional education. A concern for a revival of professional education was manifest from the beginning of the reform of the English universities in the early 19th century. Rising numbers caused by population growth, economic development and the burying of old political differences put the glare of public scrutiny on the ancient universities and provided an impetus for reform. Originally, the calls for change were unfocused and diffuse. Demands for revived professional studies were combined with complaints of outmoded studies, lack of learned research, meaningless and ritualized examinations, student extravagance and the appropriation by the rich and well-connected of charitable support which had been meant by the donors for the poor. Gradually, however, calls for renewed and expanded professional studies began to form a distinct ideology of university reform. As one reviewer wrote, attacking Oxford and Cambridge in 1846, "we cannot think that universities will be at all more successful in cultivating either truth or taste in the abstract, if everything that can be called practical, we may add, professional, be removed to a distance from them."[4] When University College, London, was founded in 1826, professional studies in Law and Medicine were stated to be one of its most important objectives.[5] Nonetheless, the most striking point about these early efforts is how little positive response they elicited, either from the public, the universities or the professions.

One problem was that the triumph of "liberal education" had meant the denigration of the intellectual value of all practical or professional education. This theme was used skillfully in an 1825 parody of the proposed curriculum at University College, London.

> The Hon. James Abercrombie is...to ground the young linendrapers and men-milliners in the law of chivalry, in which he will be assisted by his butler. ... Dr. Olympus Gregory will instruct the junior fish-mongers in the science of throwing shells, and Mr. George Grote will give lessons on the most graceful mode of standing behind a counter.[6]

A similar point was made in a satire of the Oxford Royal Commission of 1850. The evidence from "an Austrailian Colonist formerly engaged in the Oxford coaching business" ridiculed the demands being made at that time for more practical and professional education at Oxford.

> I've known Oxford Gents out in Horsetraily in werry rummy sitivations, for which they wasn't qualified by no means by a College edication; vun in partickler as wos a Boots at Sydney, and neber had been taught by any College Tutor how to put the polish on a Boot, or tell a Nugget

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1874, he argued, "They ... give opportunity to those who have to make their way in the world of entering liberal professions." Cited in Lewis Campbell, "Oxford Reform," *The University Review*, 5 (1907), 493.

4. "Oxford and Cambridge: University Reform," *British Quarterly Review*, 3 (1846), 365-66. See also "Reform of Oxford University," *Tait's Edinburgh Magazine*, 16 (1849), especially 709 for another example of this argument. Cited in Arthur Engel, "Emerging Concepts of the Academic Profession at Oxford 1800-1854," in L. Stone (ed.), *The University and Society* (Princeton, 1974), 1:322. See also on this issue at Oxford, 322-338, passim.
5. See H. Hale Bellot, *University College, London 1826-1926* (London, 1929), 53.
6. *John Bull*, 18 Dec. 1825. Cited in Bellot, 70.

when he seed it from a piece off quarts, and yet he'd paid his money to the Buzzer reglar every term.[7]

The proponents of "liberal education" saw their non-vocational classical and mathematical studies as being not only of higher educational value than the mere "information" conveyed in professional education, but also of higher social value. From this perspective, it was possible to collapse all distinctions between business, trade, science, technical skills and manual labor. The traditional contempt for business and labor could be used to dismiss all attempts to provide university education in pratical or professional subjects.

The attitudes of the professions themselves toward universities and degrees reinforced this situation. Their long tradition of suspicion of theoretical instruction and knowledge was of great importance. Also crucial was the fact that they had developed their own distinctive modes of professional training and these interests would be injured by professional education within the universities. At University College, London, for example, the plan for Law instruction failed because both the Law Society and the Inner Temple responded to this threat to their exclusive control of the professions of solicitor and barrister by setting up their own programs of lectures in 1833.[8] When University College, London attempted to obtain the right to grant medical degrees in 1833, the medical profession reacted with hostility since this would interfere with their own hospital training. They had no special love for the Oxford and Cambridge monopoly on degrees but they were unwilling to give this power to another university. Instead they were the original architects of the plan which was eventually accepted in 1837, whereby a new University of London was chartered as an examining and degree-granting institution only. In this way, the interests of the London hospitals were protected and University College gained no advantage over them.[9]

One result of this situation was that as Oxford and Cambridge went about the tasks of internally motivated reform, professional education played no role in their plans. It was only in the late 1840s, with the threat of external government visitation hanging heavily over them, that the ancient universities made any movement toward professional studies. In 1848, Cambridge established two new honors examinations, a "moral science" tripos which included political economy, jurisprudence, history and philosophy intended as pre-professional training for the aspiring lawyer, and a "natural science" tripos meant for those intended for Medicine.[10] Oxford followed suit in 1850 with parallel honors schools of "law and modern history" and "natural science."[11] Both of these new studies at the ancient universities met with very cool receptions and were not regarded with any more favor by the professions. They were essentially sops to the reforming zeal of the external critics, mostly Scottish. The fact

7. *Eureka, No. II. A Sequel to a Sequel to Lord John Russell's Post-Bag* (Oxford, 1853), 31, 33. Bodl. G. A. Oxon. 8 63 (19). Attributed to J. G. Landon of Magdalen College by E. H. Cordeaux and D. H. Merry, *A Bibliography of Printed Works Relating to the University of Oxford* (Oxford, 1968).
8. Bellot, 50–55.
9. Bellot, 215–48.
10. See W. A. Winstanley, *Early Victorian Cambridge* (Cambridge, 1940). See also Rothblatt, *Revolution of the Dons,* 135, 166–7.
11. See C. E. Mallet, *A History of the University of Oxford* (London, 1927), 3:294–97.

that these new studies attracted few students and those not of the highest caliber was itself useful in justifying the original hostility of the universities and their low opinion of the intellectual value of these subjects.

In all of the traditional learned professions, formal education began to play some role in professional training in the early 19th century, though the universities had only a very small part in this development. In Medicine, the movement toward certification and licensing which began with the Apothecaries Act of 1815 served as a powerful stimulus to the creation of medical schools. In several provincial cities, medical schools were established in the 1820s and 1830s which eventually became the nuclei of the university colleges and new universities of the late 19th and early 20th centuries.[12] At University College, London, the medical department was the most flourishing part of the institution in the early years.[13]

The movement toward the establisment of theological colleges also began during this period. They were an expression of the realization that, given the low value of so many church livings, growing population and the increased standards of pastoral activity expected from the clergy, it was hopeless to expect that the universities would be able to supply this need.[14] Nonetheless, there were great fears that such professional education for the clergy would produce undesirable narrowness, sectarianism and theological pecularities.[15] One of the strong motivations for the eventual establishment of honors schools and tripos in theology at Oxford and Cambridge was the feeling that these inherent dangers of professional education could be minimized most effectively through their inclusion within the broadening, "liberal" culture of the university.

The Law showed the least interest in formal education throughout the 19th century. Since barristers were undoubtedly the most prestigious professional people of the period, they saw no reason for change. The small movement toward formal education represented by the lectures at the Inns of Court and the creation of a rather perfunctory examination for admission to the bar were simply tactical moves to forestall encroachments on their autonomy by University College, London.

The attitude of the traditional learned professions toward the universities had a profound effect on the newer occupations such as engineering, accountancy, architecture and dentistry which had aspirations toward professional status. In general, the policy of all aspiring and upwardly-mobile occupations has been to imitate as exactly as possible the formal characteristics of the most respected profession of their

12. For example, Sheffield established a medical school in 1828, Leeds in 1831 and Durham in 1836.
13. Bellot, 124.
14. See F. W. B. Bullock, *A History of Training for the Ministry of the Church of England in England and Wales: From 1800 to 1874* (St. Leonards-on-Sea, 1955), esp. 37–44. St. Bees was founded in 1816, St. David's, Lampeter in 1822, Islington in 1826, Chichester in 1839 and Wells in 1840. For changing clerical ideals, see Brian Heeney, *A Different Kind of Gentleman: Parish Clergy as Professional Men in Early and Mid-Victorian England* (Hamden, Conn., 1976).
15. These fears were especially marked at Cuddesdon College, which was founded in the diocese of Oxford by Samuel Wilberforce. See Owen Chadwick, *The Founding of Cuddesdon* (Oxford, 1954).

period. In the 19th century the bar led the professions both in terms of income and status and their distaste for professional education had a great impact on other nascent professions. Since the bar had no real connection with the universities except as purveyors of honorific degrees, new occupations didn't look in this direction either. They put their emphasis on forming professional organizations, gaining state recognition and eventually certification. In terms of training, they were content to rely on the traditional system of apprenticeship, articles and practical experience.[16]

The Reintroduction of Professional Education into the University:

The really important change in this picture of very limited contact and mutual suspicion between the English universities and the professions did not occur until the 1860s and 1870s. England's economic success and industrial superiority to the other nations of Europe had been the great unspoken argument in favor of English self-satisfaction with her institutions. This support began to fall away after the Paris exhibition of 1867, which had revealed a traumatic contrast to the Great Exhibition of 1851. German and French technical achievements were the star attractions of the 1867 show and the superiority of English manufacturers was no longer evident. English self-confidence continued to decline in the 1870s and 1880s as it became clear that England was being outstripped industially by Germany. Since German industry was supported by an elaborate system of technical, scientific and professional education, an increasing flow of anxious government commissions and reports began to insist that the English must imitate this trend if they were to maintain their economic position.[17] The close and obvious connections between industrial and military power gave this argument a further note of urgency.

The expansion of the English university system itself in the second half of the 19th century also had the effect of drawing closer connections between the universities and professions. The new university colleges, founded as expressions of civic pride, often by donors with a keen interest in technical and scientific education, had none of the traditional qualms about catering to student or public needs for vocational and professional training. Especially after their attainment of independent status as degree-granting institutions, the new universities moved aggressively into the area of professional education. For example, when Liverpool became a separate university in 1903, it quickly established degree programs in dental surgery, architecture, veterinary medicine and engineering. Student numbers practically doubled during the first

16. For example, although University College, London had founded professorships in architecture and engineering in 1841, these subjects attracted few students until the 1880s. See Bellot, 265-67.

17. See, for example, the report by Prof. L. Levi on *Technical, Industrial and Professional Instruction in Italy and Other Countries, Parl. Papers* 1867-8 (33) liv. Also see the translation of the French Ministry of Agriculture, Commerce and Public Works report on "Technical Instruction," *Parl. Papers* 1867-8 (3967) lv. See also the report of the Royal Commission on Scientific Instruction and the Advancement of Science, *Parl. Papers,* 1871 (C. 318) 24 (and the seven additional reports on this subject 1872-1875). See also the Royal Commission on Technical Instruction, *Parl. Papers* 1882 (C. 3171) 27 (and the second report in four volumes in 1884).

decade of university status.[18] At Leeds, although a professorship in economics had been created in 1901–02, it was not until 1904, when it attained independent university status, that a degree in "Commerce" was established.[19] Within its first decade, Sheffield entered into legal education, architecture, teacher training and mining.[20]

An unwonted tone of aggressive support for professional and technical education at the new universities can be caught in the speech of Sir Richard Henn Collins, the Master of the Rolls, at the Annual Court dinner at Leeds University in 1906. In proposing the toast to the University, he asserted:

> They had had the courage to treat subjects which were connected with earning a livelihood as fit subjects for University teaching, and the action of Leeds University in introducing the arts of weaving, dyeing, engineering, and agriculture, and he might say law, although it did not stand in absolutely the same category, was pregnant with future consequences for the country. It seemed a strange thing that any one should consider that such subjects ought not to form part of a University training, but ten years ago they would have been looked upon as altogether out of the pale of a University curriculum.[21]

Nonetheless, by placing his own profession, the Law, in a somewhat different "category," Collins seemed to suggest an uneasiness with the leveling tendencies of his own position. When Sir Nathan Bodington, the vice-chancellor, replied to the toast, he struck a simlar note of advocacy of professional and technical education, albeit in a more moderate tone and without any tendency to place all occupations on an equal footing:

> They were trying to think of the University as that which provided, not for the education of a privileged class, nor for the education of one or two of the learned professions, but for something which was above the secondary education a boy received at school, and which was necessary for any man who wanted to be a leader in his calling.[22]

At the ancient universities, there was also some movement toward more professional and technical education, but it proceeded more slowly and amid more opposition. The proliferation of independent degree-granting universities after 1900 and the lure of government grants probably had some effect in hastening this development since, prior to this time, efforts toward more professional education, especially in the newer professions, were generally defeated at Oxford and Cambridge on the traditional ground that it was not the proper role of the university to provide anyone with training "in the technicalities of their calling," as the Oxford opponents of the creation of a teacher training course complained in 1891.[23] After 1900, however, the proponents of such plans were more often successful. At Oxford, diploma courses in engineering, mining, education, surveying and forestry were all established in 1904 or soon there-

18. See Stanley Dumbell, *The University of Liverpool 1903–1953: A Jubilee Book* (Liverpool, 1953), 9–10.
19. See William H. Draper, *Sir Nathan Bodington* (London, 1912), 193.
20. See Arthur W. Chapman, *The Story of a Modern University: A History of the University of Sheffield* (London, 1955), 159, 213–19, 219–23, 224.
21. This speech is quoted in *Sir Nathan Bodington*, 192.
22. *Sir Nathan Bodington*, 192–93.
23. See, *Opposition to a Proposal to Establish in the University "A Day-College for Training Elementary Teachers"* [Oxford], June 2 [1891, handwritten], G. A. Oxon, c. 153.

after. At Cambridge, courses in industrial design and agriculture were introduced while engineering obtained both an ordinary degree and a tripos.

A few of the more radical college tutors were even wholeheartedly in favor of honors schools and degrees in the subjects of the new professions. One group of eight Oxford college tutors proposed in 1907:

> The University fails in the trust which the country has come to repose in it as an educational authority, if it omits to provide such Faculty organization for any established profession or calling, which from time to time comes to demand specialized theoretic training in its practitioners. To limit Faculty organization to the subject matter of the professions which were already recognized as such in 1400 A.D. is to claim that Oxford has no concern with the education of a large section of the modern world. The strongest claims are those of the professions of teaching, engineering, and applied science generally, and, in England at all events, of agriculture.[24]

A chair in engineering was established at Oxford in 1908 and the new professor, Charles Frewin Jenkin, by skillfully accepting traditional beliefs in the value of apprenticeship and the confining of university study to the more theoretical aspects of his subject (and by explicitly eschewing continental examples) was able to persuade the University to create an honor school in engineering.[25]

Jenkin's argument for creating a degree program in engineering is worth exploring in some detail since it illustrates the skillful blending of new ideas with long-established values. Jenkin was very much the right person to introduce engineering into Oxford since he was a firm believer in building on traditional English practices. He was no admirer of the "polytechnics" of France and Germany. He quoted approvingly a witness before the Royal Commission on Technical Education (1884) who criticized foreign technical schools: "Those schools are apt to teach the student details which he mistakes afterwards for principles."[26] Jenkin argued that it was not possible to train an engineer exclusively through formal schooling. Theory could be taught in this way, but only experience could supply the rest. "Is it possible by any college education to make a man an engineer?" Jenkin asked. "No, it is not. All that can be given in college is the scientific training. Science can be taught, but before the training is complete the engineer must learn a host of facts which he can only learn by experience. Experience cannot be taught."[27] Jenkin argued that the old system of apprenticeship alone had its defects as a sole training for engineers, but that the ideal would be to combine theoretical training in the university with apprenticeship afterwards. He attacked the technical institutes which had been gaining popularity in England:

> The great extension of technical schools in England is, I believe, largely the result of copying the continental and American practice. The palatial buildings and costly equipment impress English visitors, and the public cry out for similar appliances here; but I believe it is a retrograde step. These schools abroad were built because they lacked what we had. Are we to throw away our apprenticeship system and follow them in a vicious cycle?[28]

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24. *Oxford and the Nation.* Reprinted from *The Times* (London, 1907), 33.
25. See Jenkin's inaugural address, *Engineering Science* (Oxford, Oct. 16, 1908), 2625 d 55 (10).
26. Jenkin, 7.
27. Jenkin, 6.
28. Jenkin, 8.

Jenkin was also very tactful on the sensitive question of finances. Other science professors had complained often and clamorously of the poor provision for scientific instruction and research at Oxford. It must have been quite pleasant to this University audience, therefore, when Jenkin assured them that great work was often accomplished in primitive laboratories.

> When I remember the dingy little classroom in Edinburgh in which my father taught, [he had been one of the first British professors of engineering] and all the engineers who were trained in it—there was no laboratory, no apparatus—I feel sure that Oxford students need not suffer from the roughness of our accommodation or the simplicity of the apparatus, and I am confident that in the future—the near future—as our numbers and needs increase, those generous benefactors who have enabled the Chair to be founded will see that we have a home worthy of the University.[29]

Even in asking the University for a degree program in engineering, Jenkin managed to include a graceful compliment. "I need hardly point out to you how essential a final school in engineering is as a goal for the student to work for," he argued.

> I hope I have shown that the scheme includes an educational course of the highest value and worthy of recognition by the University. Without this recognition the whole must fall to the ground. The other English Universities have long ago made engineering an avenue to their degrees. It may be wise for Oxford to move slowly and consider its steps well, but I believe that the time has now come—I take it that the foundation of this new Chair proves that in your opinion also the time has come—for Oxford to advance ... I appeal to you, therefore, with confidence to receive this scheme favourably, by which the path to Academic honours will be opened to engineers.[30]

Perhaps to some degree due to Jenkin's skillful argument, his appeal was successful and an honor school in engineering was created.

Yet the development of engineering and other professional and technical studies at the ancient universities was by no means smooth. At Cambridge, despite its mathematical traditions and, therefore, its greater receptiveness to science, the more technical and applied branches were often unpopular. It was felt by some that such inappropriate subjects had been forced on the University by government pressure.[31] At Oxford, where scientific traditions were considerably weaker, the hostility to the new subjects was more overt. Bitter animosities were revealed in 1912 over the proposed new Engineering Laboratory in the University Parks. Although some of the hostility to the laboratory was undoubtedly caused by the encroachment on the Parks, there was also a strong current of repugnance and contempt for engineering itself. As one critic of the proposed site bluntly remarked, "[Engineering] must always be, and ought to be, quite a secondary [subject] at Oxford. It is neither possible nor desirable that many of the future engineers of the country should be trained here."[32] Similarly,

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29. Jenkin, 21.
30. Jenkin, 21–22.
31. See Rothblatt, *Revolution of the Dons*, 254–55.
32. See *The Proposed New Engineering Laboratory* ([Oxford,] [1912]). G. A. Oxon c. 310 (100). Even this critic didn't oppose the laboratory itself, but suggested that it would be more appropriate and inexpensive to build it among the tenements of St. Thomas' and St. Ebbes'. See also J. S. Townsend, *The Proposed Engineering Laboratory* ([Oxford,] [1912]) G. A. Oxon. c. 310 (101).

when in 1910 it was proposed to create an honor school in Forestry, the opponents argued squarely against professional education in the university. They complained that in this school "fragments of different Sciences would be studied simply in their application to some particular profession." They also argued that the examination would include "much that is not Science at all, such as Forest Management and the Valuation, Exploitation, and Utilization of Forest Products." They concluded: "It appears to us that an examination of this kind would be inconsistent with the whole character of the Honour Schools of the University."[33] Nonetheless, it is indicative of changing university attitudes that in the end engineering got its laboratory (though not in the Parks) and forestry got its honor school.

With this development of university interest in the professions and, especially, as new degree programs were created, the professions themselves, especially the new and aspiring ones, came to appreciate the traditional value of university degrees as external signs of "scientific" status. It was the existence of university degrees which had given the church, the law and medicine the right to view themselves as "learned" professions. Universities played a crucial role in the creation of the ordered bodies of knowledge on which the claims of a profession to special expertise and to a unique position of dominance over the purchasers of their services had been based. Degrees were valuable, therefore, not only as ornamental symbols of status but as justifications for professional power and autonomy. Even though traditional patterns of professional organization and the previous indifference of the universities had led the new professions to take the alternate route to power and autonomy through licensing and certification by their own "qualifying associations" rather than through the universities, the value of the degree as an additional support for power and status was not wholly lost on the new professions. One manual of advice to the aspiring dentist noted in 1890:

> Many British licentiates run over to America for a post-graduate dental course in the schools or colleges there, and return with a good knowledge of American nicknacks, greater skill in gold-filling, sometimes also a passion for using ether, and generally with the letters D.D.S. (Doctor of Dental Surgery) or D.M.D. (Doctor in Dental Medicine) after their names, the license in America being a University degree.[34]

Despite the author's obvious contempt for the vanity of degrees when the reality of licensing had already been attained, it was evident that other practitioners saw some value in this outward stamp of their new professional status. It was clear that when Liverpool, for example, established its degree program in dental surgery in 1903, it could be certain of at least some interest among dental students.

The Tension Between Practical and Theoretical Training:

The problem was that the clear willingness of the universities after 1900 to provide professional education and even to create new degree programs for nascent professions, came when the English pattern of autonomy for the "qualifying associations"

33. Untitled flysheet dated Feb. 28, 1910 in G. A. Oxon, c. 310 (19).
34. Arthur Turner, *A Manual of Dental Education with Some General Notes upon the Modern Curriculum of the Dental Student* (Edinburgh, [1890]). 26322. e. 12 (6).

of each profession was already firmly established.[35] To give to the universities the power of certification through the granting of degrees would mean a painful diminution in professional independence. When Joseph King M.P. called upon Oxford and Cambridge in 1892 to provide "as much the stepping-stones to a mercantile career, to the engineer's office, to the life of an agriculturist or a scientific man, as it does to the church, the bar, or the schoolmaster's profession,"[36] he was met by a bitter reply from Oxford, which emphasized not the traditional commitment to "liberal education" but the powerlessness of the University in relation to the professions.

> If it is the wish of democracy that success at the University should be a help in all professions, democracy will have to give the University those keys of professions which in other countries are entrusted to its care. Let Mr. King and his friends, as a beginning, inquire how it comes that in this country the Inns of Court and the Incorporated Society—and not the Universities—admit to the two branches of Law, and certain 'Colleges' to the profession of Medicine.[37]

While the continental universities had been gaining from the state the power of professional certification, the English universities had been more concerned to protect their much richer endowments from governmental encroachment. When the English universities began to see professional education as an opportunity rather than as a threat, their chance for power had already been lost.

A good example of the conflicts between entrenched power in the qualifying associations and the accommodations necessary to cooperate with the universities can be seen in the struggles between Sheffield and Leeds Universities and the Incorporated Law Society. In 1908, both universities established law degrees for aspiring solicitors.[38] In order for the university course to have any attraction for students, it was essential that it exempt graduates from some substantial portion of the five years of articled pupilage required by the profession. The Law Society proposed a two year exemption but only on the condition that all degree programs have "the initial and continued approval of the Council of the Law Society." They also wanted to retain the right to question any individual student's qualification for the exemption even after passing the university examinations. Not surprisingly, Leeds and Sheffield protested strongly against these conditions. "It is a fundamental principle of University organization that, in the conduct of its academic work, each University should be autonomous and should bear the full responsibility of the standards exacted in its teachings and examinations," they asserted.

> For the Universities to assent to a condition, under which another body, however eminent, would be in a position to control their performance of the duty entrusted to them by Royal Charter, would be a violation of the spirit of the Charters. It would, moreover, be contrary to the

35. It is significant that one modern English student of the professions uses the existence of these associations as his basic definition of a profession. See Geoffrey Millerson, *The Qualifying Associations: A Study in Professionalization* (London, 1964).
36. "Democracy and Our Old Universities," *The Contemporary Review*, 62 (1892), 707–08.
37. "Contemporary Statistics," *The Oxford Magazine*, 11 (1892), 66.
38. There had been some legal education at both Sheffield and Leeds since their university college period. The Law Society cooperated to the extent of contributing £ 50 to the scheme and the local practitioners agreed to let their clerks attend classes one day a week. See, *The Story of a Modern University*, 154–56.

best interests of education to fetter the judgment of institutions whose standing and records are sufficient guarantees of the character of the training which they provide.[39]

In the end, the universities won this struggle and the Law Society agreed to accept graduates without further examination. Since the new scheme would have the effect of losing practitioners two years in pupilage fees from those clerks who had taken the university option, there was some rationale for their feeling that the profession was making an unduly great sacrifice to obtain university recognition. It should be noted, however, that even this "victory" put the university-educated articled clerk at a one year disadvantage to the clerk who had taken the customary path of office training alone. The university course occupied three years and it only excused the graduate from two years of articled service. It was hardly surprising that many aspiring solicitors continued to prefer the traditional system of training.

The 20th century has been a continuation of this situation. University professors have continued to find it necessary to insist on the status value of their degrees and especially on the role of the university in certifying the "learned" or "scientific" nature of a profession. Two Cambridge professors made this point strongly in their recommendations to the 1922 University Commission. "The Engineering Profession is now making a serious effort to improve its status and to become classified as one of the learned professions," noted Professor C. E. Inglis. "In this movement Cambridge ought to play a leading part and set the standard of engineering education," he concluded hopefully.[40] In a similar vein, Sir William Ridgway asserted: "Our idea in founding the School was to place the art of Architecture on a higher plane than hitherto known, at least in this country, and to make it a science as well as an art."[41] In 1933, Carr-Saunders and Wilson, in their classic study, *The Professions,* also found it necessary to insist that

> it is most desirable that the indispensible technical training not be conducted in too narrow an atmosphere. The association of students studying different techniques, medicine, law, dentistry, engineering, chemistry, and so on, such as occurs in a modern university, may do much to widen understanding and to create diversity of interests. Moreover, since research is a prominent feature of university activities, the atmosphere is less likely to be heavy with instruction than in purely teaching institutions. On this account there is much to be said for the training of entrants to the professions in universities, and much to be said against isolated professional schools.[42]

The same arguments which had been used a hundred years before against separate theological colleges were still useful in the continuing struggle to integrate the universities and professional education.

In the professions as well, those who have encouraged closer university ties have continued to feel dissatisfaction, despite some movement toward the implementation of their principles. The historian of English accountancy remarked in 1954:

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39. *The Story of a Modern University,* 219–23.
40. "Memoranda with Regard to Reforms at Cambridge," MS. Top. Oxon. b. 105 (13), 2. Professor Inglis's concern was to abolish the "special course" in engineering at Cambridge, leaving only the tripos, since this ordinary degree was not accepted by the qualifying associations as a professional qualification.
41. "Memoranda with Regard to Reforms at Cambridge," MS. Top. Oxon. b. 105 (29), 2.
42. A. M. Carr-Saunders and P. A. Wilson, *The Professions* (Oxford, 1933), 373–74.

It is not to decry or to belittle members of a great profession when I confess that what, above all considerations, prompted me to embark on writing this historical study has been the desire to draw attention to the limited intellectual development of the profession. Perhaps the appearance, a century and a half ago, of modern accounting as a severely pragmatic subject is largely responsible for this phenomenon. ... The most significant intellectual addition to professional culture has been the linking-up of the profession with the universities. Such attempts as have been translated into reality thus far are important departures but still incommensurate with the needs of a major profession. More emphasis upon several matters embracing the intellectual side of accounting is needed to remedy current shortcomings.[43]

Stacey argues that accountants ought to study not merely the technical skills of their profession but the social and economic structure of the society in which they function. He complains that the lack of university faculties in this field and the continued dominance of the apprenticeship (pupilage) system has led to an overly pragmatic and narrow spirit in the profession.[44]

The very existence of this persistent chorus of assertion, advice and complaint from the universities and the professions indicates the continued strength of traditional attitudes. Although there has been a steady expansion in the linkage between English universities and the professions in the 20th century as the professions themselves have grown,[45] the mark of their historical antipathies can still be seen, both in the universities and in the professions. The low status of business and of technical and applied scientific studies as opposed to pure science and arts subjects has been one legacy of this situation. The relative smallness of the English university population in relation to the other developed nations is another result. The comparatively weak link between English universities and industry has also stemmed from this cause. Essentially, by clinging to the value of "liberal" and non-vocational education, the English universities placed themselves in a situation which severely limited their potential for both growth and influence.

43. Nicholas A. H. Stacey, *English Accountancy 1800–1954* (London, 1954), xvi.
44. Nonetheless, one can understand that from the viewpoint of practitioners, the inevitable losses in pupilage fees might loom larger than the intellectual benefits of university affiliation.
45. The British census figures for the professions are difficult to interpret because changes in the system of occupational categories make it impossible to trace trends for more than thirty years. Nonetheless, it seems clear that the major growth in the professions has occurred in the period since 1920. From 1881 to 1911 the category of "professional occupations and their subordinate services" grew modestly from 3.9% to 4.4% of the employed population. From 1921 to 1951, however, the new category of "professional and technical occupations" grew from 4.1% to 6.1% with most of the growth (4.4% to 6.1%) occurring between 1931 and 1951. These figures were obtained by combining the statistics for males and females from B. R. Mitchell and Phyllis Deane, *Abstract of British Historical Statistics* (Cambridge, 1961), 60–61.

Charles E. McClelland

Professionalization and Higher Education in Germany

What was the relationship between the professionalization of occupations and higher education in Germany between 1860 and 1930? Although the question artificially delimits our inquiry, the abiding centrality of higher education to professionalization in Germany cannot be disputed. This centrality in all advanced societies is assumed even by otherwise antagonistic analyses.[1] Furthermore, it was, if anything, greater in Germany, where the higher educational system had largely evolved to its classic form before high industrialism, was a state monopoly, and was in a position to control the demands of many occupational groups for professional legitimation.[2]

These preliminary remarks about the peculiarity of professionalization and higher education in Germany suggest an interactive triangle. The professions themselves (including their representative organizations) and the institutions of higher education were joined by the German states in pushing or retarding professionalization. The state was not only the ultimate arbiter of higher educational policy through its ministries and budgetary grants by offices and parliaments, its "state officials" in chairs and other professorial or educational offices, its examination commissions for aspirant professionals, its post-educational certification system and its decision-making

1. See Talcott Parsons, "Professions," *International Encyclopedia of the Social Sciences* (New York, 1968), 536–46; and H. Jamous and B. Peloille, "Professions or Self-Perpetuating Systems? Changes in the French University-Hospital System," in J. A. Jackson (ed.), *Professions and Professionalization* (Cambridge, 1970), 109–152. For a sample of German conceptions of professions (which differ markedly from Anglo-American ones), see J. F. Volrad Deneke, *Klassifizierung der Freien Berufe* (Cologne and Berlin, 1969) 13–30; Hans Kairat, *"Professions" oder "Freie Berufe"* (Berlin, 1969), 12–38; Helmut C. H. Gatzen, "Beruf bei Martin Luther und in der industriellen Gesellschaft" (Dissertation Münster, 1964); also Arthur Salz, "Zur Geschichte der Berufsidee," *Archiv für Sozialwissenschaften und Sozialpolitik,* 37 (1913), 380–423.
2. To illustrate this point, one might compare the repeated invocations of *Wissenschaft* (science or, more broadly, a theoretically grounded expertise) as the highest goal of education by German professors with the constant attention to "customer service" among American professors at the end of the 19th century. See Burton J. Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York, 1976), esp. Chapter 8.

powers concerning many individual careers. It was also a tone-giving abstraction, model, and dispenser of ideas of prestige.

The Professions:

In 1860, relatively few occupations were professionalized. Such general indicators of professionalization as highly specialized formal education, codes and traditions of occupational behavior, special privileges and obligations, and organization of members of the same occupational group were characteristic of only a few professions.[3] What set the professions off from other trades was the general connection of their formal training with universities, the special mysteries of their knowledge, the high degree of elaboration of their codes of behavior, privileges, and obligations, the autonomy of their practice, and a large amount of respect for their organizations.

The most important professions in the German states in 1860 were the traditional callings of clergyman, physician, graduate in law, and academic professor. All clergymen and professors as well as a large proportion of the legal graduates practiced their professions as officials of the church or state. Partly for this reason, private professional organizations were weak or nonexistent, particularly on the national level. Official disapproval of agitation for German national unification had throughout the early 19th century discouraged universal German professional organizations. Those that did exist were often undifferentiated, such as the *Verband deutscher Naturforscher und Ärzte* (League of German Natural Scientists and Physicians), which had been founded in the 1840s to promote science.

Membership in a fully recognized profession was thus tied very strongly to higher education and to the subsequent legally defined initiation into the practical experience represented by the equivalent of years of poorly paid internship. For this reason, "new" professions (e.g., engineer, schoolteacher, private architect, or economist) tended to form vocal, activist organizations that could lobby effectively for recognition of their status and, typically, the upgrading of educational paths into their occupation.[4] The model for a professional career had already been loosely set by the "old" professions.

The connection of the prestige of a learned profession with the officially prescribed initial steps in a career (culminating in higher education, state examinations and apprenticeship) indicates that association with public authority (the churches or the state) rather than with the "professional" organizations tended in 1860 to establish the identity of a profession. If closeness to such authority lent prestige, distance from it had the opposite effect.

The vaunted academic freedom of the universities and of professionals in many areas of expertise to choose between state and private service were all mere privileges granted by the state. German sociologists from Tönnies (postively) to Dahrendorf

3. It might be mentioned that some of these characteristics had at one time been found in the artisan occupations organized into guilds, which were continuing their long decline in German states in 1860.
4. G. Hortleder, *Das Gesellschaftsbild des Ingenieurs* (Frankfurt, 1970), 18–20; Hans Schimank, *Der Ingenieur* (Cologne, 1961), 39–41.

(critically)[5] have pointed to the exceptional degree to which German values in modern times have differed from "Western" ones in emphasizing *Gemeinschaft* over *Gesellschaft* (public virtues over private virtues), and the priority of demands by the state over those of the individual or organizations of individuals. In this climate, professional organizations have frequently had to battle harder than their counterparts in other countries against the charge of serving only their "private" interests. They have had to emphasize their cooperation with the state and its educational system, to align themselves with the state's rhetoric and imagery concerning their professions, and to press their demands in a very gingerly fashion.

The complex position of law graduates in the professional hierarchy may serve to illustrate this point. German law graduates could choose to enter one of two branches of the legal profession: the administrative and judicial divisions of the state or private practice. Despite the fact that such private attorneys *(Rechtsanwälte)* were officers of the court, they had always been held in lesser esteem than law graduates in the judiciary and civil service. But after a lowering of barriers to private practice, culminating in the national *Reichsanwaltsordnung* of 1878, private attorneys, no longer strongly tied to the state and the court system, ironically began complaining about a decline in their status. Though required to be as well-qualified as any judge, they did not have the prestige or, in most cases, the earnings of their colleagues on the bench. The number of attorneys increased both absolutely and in relationship to the population after 1878; the reform also appears to have led to a reduction of the attorneys' real average income. By turning private legal practice into a more genuinely "free" profession, the German states increased the prestige gap between the state lawyers (higher civil servants and judges) and attorneys at law. Despite the later organization of attorneys on a national scale and discussion of ways to raise the honor and incomes of private lawyers, the gap within the legal profession persisted until after 1930.[6]

The persistence of high prestige attached to the traditional university-oriented professions, especially those that involved direct civil service status, caused the evolution of the professions in Germany to follow a somewhat different path than in other countries. Sociological theory of professions that departs from relatively free British or American conditions cannot apply to professions in a highly bureaucratized and authoritarian society.

Both the "old" and "new" professions were organized into autonomous, private associations after 1860. Early attempts dating back to the 1840s and even before had mostly foundered on the rock of state opposition, particularly against national organizations. But by about 1860, the new current of nationalism in Germany and a more liberal attitude by many states led to more successful organizational attempts. German attorneys organized nationally in the *Deutscher Anwaltsverein* in 1870; physicians, in the *Deutscher Ärztevereinsbund* in 1873. Typically such organizations took the form of an alliance among already existing local groups; they then attempted to set up local chapters where none existed. Other members of the "old" professions

5. Ferdinand Tönnies, *Gemeinschaft und Gesellschaft* (Leipzig, 1887); Ralf Dahrendorf, *Society and Democracy in Germany* (Garden City, N.Y., 1967).
6. Fritz Ostler, *Der deutsche Rechtsanwalt, 1871–1971* (Essen, 1971), 207–9.

were less quick to organize nationally, partly because they were not "free" practitioners like attorneys and physicians, but rather officials. The *Deutscher Juristentag,* or legal convention, did organize in 1860 and included some civil servants, such as judges, state's attorneys and professors, but it was cautious not to lobby for *Standesinteressen,* that is, the legal profession's self-interests: instead, it devoted much of its attention initially to reform and codification of German law. Even the private professional organizations claimed that an interest in the scientific and benevolent side of their occupations was the major reason for their foundation, and meetings of professional societies in the first decades after 1860 did indeed spend a great deal of time discussing non-material issues.

The remaining "old" professions were even slower and usually organized only in the face of some perceived threat. Protestant pastors founded the *Verband deutscher evangelischer Pfarrervereine* in 1892, following the lead of a local organization in Hessen that was prompted to act by a government decree ordering pastors not to get mixed up in anti-semitic agitation. University professors did not create an organization until 1907, largely spurred by their perception of unwarranted government interference in academic self-government. Once founded on high-sounding principles, however, most of the national associations of the "old" professions gradually spent more and more time on so-called *Standesfragen* or questions of material and status self-interest.[7]

"New" professionals followed a somewhat similar pattern. Relatively independent ones (engineers, dentists, and apothecaries) organized as early as the 1850s, whereas those employed by the state (e.g., schoolteachers, surveyors) delayed until much later. In the case of both "old" and "new" professional organizations, the tendency was not to press for the dissolving of ties with the state, but only for their rearrangement. Physicians and attorneys, for example, felt uncomfortable with the relative deregulation of practice by the legislation of the liberal phase of the North German Confederation and early *Reich.* The medical organizations constantly called on the state to suppress *Kurpfuscherei* (unlicensed health-care) and lobbied for legislative aid in their long guerilla war against Bismarck's health-insurance funds. Attorneys sought to raise their status by seeking government-granted honorary titles. Gymnasium teachers by the end of the 19th century clamored for officially proclaimed equality with the minor judiciary. Engineers fought unsuccessfully to have the state protect the title *Ingenieur* from use by mere mechanics and tinkerers. In all these cases and many others, one can perceive a thread of yearning for a nearness to public authority outside the ranks of the professions.

Some "new" professions with highly bureaucratized career patterns found it necessary to organize and agitate for greater state recognition of their professional status. Teaching groups in particular protested about their increasingly difficult economic position and their lack of professional autonomy. Non-tenured teachers in universities and other tertiary educational institutions, e.g., *Privatdozenten* and many *ausserordentliche Professoren,* organized a league of "non-full professors" *(Nichtordinarienbund),* and high school teachers did the same. A characteristic feature of public

7. For a superficial survey of the German professional organizations down to 1906, see W. Kulemann, *Die Berufsvereine,* 6 vols. (Jena, 1908), esp. vol. 1.

organizations in the German *Reich* after about 1880 was an increased pursuit of economic self-interest, sometimes quite blatantly. An example of the trend may be drawn from the history of the *Verein deutscher Ingenieure.* The VDI was founded in 1857 as a league of Germans in technology, industry, and applied science. For many decades it attempted to fuse the interests of engineers, laymen interested in technological developments and industrialists. While it rallied around a high vision of the social utility of *Technik,* many members began splitting off from it in the 1880s to join new, more vigorous interest-oriented groups.[8]

The organization even of such "old" professions as medicine and law indicates comparable difficulties in establishing universal norms of professional conduct and, additionally, an uphill battle to wrest control of professional standards from the state. Before 1873, the German medical profession was organized locally. Most states had some kind of *ärztliche Standesvertretung* (for example, "chambers" of physicians), but by no means all. The *Deutscher Ärztetag* might better be called a "convention" than an "association" of medical practitioners, but it often sought to influence government medical policy and to achieve a role for the local medical "chambers" in such matters as licensing, professional discipline, and titles. In 1882 the *Ärztetag* met in Nürnberg and called for a national physicians' law, parallel to similar legislation for German lawyers four years before. Such legislation was meant to unify professional conduct and rights and, very clearly, set up local medical organizations where they did not exist and grant all such organizations sweeping rights over the profession. Their demands suggest the relative organizational weakness of the German medical profession previously and the correspondingly large role of the state organs of medical affairs.[9]

Despite slow beginnings, by 1930, virtually every professional group had organized and indeed overorganized. The characteristic feature of this later wave of organization was, however, its heterogeneity. Among all the professions, old as well as new, it proved impossible to achieve a national unanimity and corresponding singleness of representation. Traditions of localism long outlived the unification of Germany into a single state in 1871. Despite the political unity of Germany, admission to and regulation of the medical profession, the bar and bench, the clergy, and university teaching were still matters for the states, not the *Reich,* to administer. By the eve of the First World War, virtually all professional organizations, both old and new, were clamoring in one way or another for more state intervention to protect their status and incomes. These demands only increased in number and volume in the unsettled era between the world war and the collapse of the Weimar Republic. Thus to understand the professions and their organizations, we must also understand their relationship to the state.

The State and the Professions:

The new princely *Polizeistaat* of the late 17th and 18th centuries assumed, along with greater tasks of war and taxation, an increasing amount of responsibility for the

8. Hortleder, 44–9.
9. Anon., "Die korporative Organisation der Ärzte," *Schmollers Jahrbuch,* 6 (1882), 1363–4.

"public welfare." At the same time, the professions were held in fairly low esteem by both the public and the princely bureaucracies.

At the beginning of the 18th century, for example, the king of Prussia decreed that lawyers in his realm should wear knee-length black robes. He did this not to heighten their dignity, but merely to make them identifiable in the street, so that the people could "see the scoundrels coming."[10] At about the same time, an official of Hanover referred to physicians as "exterminating angels" whose main tasks were to hurry along the death of their patients and bury them methodically.[11]

By the end of the 18th century, however, many states had begun to take measures to improve the quality of the professions and to bureaucratize them. As universities were reformed and granted much greater freedom of instruction, examinations became more and more necessary to insure that graduate candidates for professions had not overly abused their freedom from standard courses. Official boards were appointed by the government to administer state examinations. Medical, legal and clerical careers began, by the early 19th century, with a post-university examination and often an extended period of on-the-job training. Thus the state took away with one hand a part of the new academic freedom it granted to students with the other.

Because studying for a profession was expensive and the unpaid period of post-examination training financially burdensome, the state's requirements in effect discouraged all but a few poor people from the professions. Government pressure helped keep the size of the student body and the old professions relatively stable until about 1870.

The German states achieved this stability by discouraging the formation of independent professional organizations and upholding regulation by government or quasi-government agencies such as the *Ärztekammer* or local physicians' chambers. Not only were competence and professional standards determined by the states through examinations and official supervision of professional conduct; but even the political and religious opinions of the professionals were carefully scrutinized. Since most members of the old "free professions" were in one way or another public employees of the state, they were easily intimidated.

The new professions emerging in the 19th century enjoyed comparatively more freedom from government interference, at least initially. The state authorities tended at first to look upon the new professions as mere trades. Even the education, certification and supervision of the new professions differed radically from the old: schools for engineers or schoolteachers were little more than drill grounds and barracks for their immature charges. They were allowed far less chance to develop independent minds and develop self-esteem than university students.

Between 1850 and 1930, however, the German states and the *Reich* itself went through several distinct phases in attitudes toward the professions, both old and new. A period of liberalism in the 1870s produced greater independence for some of the older professions, notably medicine with the *Gewerbeordnung* of 1869 and law with the *Reichsanwaltsordnung* of 1878. From the 1880s until the First World War, howev-

10. Adolf Weissler, *Geschichte der Rechtsanwaltschaft* (Leipzig, 1905), 310–16.
11. J. G. von Meiern, cited in Götz von Selle, *Die Georg-August-Universität zu Göttingen, 1737–1937* (Göttingen, 1937), 27.

er, the German states resumed their supervisory role, though without quite the crushing authoritarianism of the early 19th century. Private professional organizations, for example, were now tolerated and even heeded occasionally by government policymakers.

The Weimar Republic, by tendency both liberal and weak, was unable or unwilling to intervene very effectively in matters impinging on the security of the professions.

This bare sketch of the relationship between the German states and professions may lead us into the arena in which both interacted most strongly, namely in that of education. It was here, through the virtual state monopoly of higher education, that the German professions were most profoundly affected by state power. Yet the institutions of higher education themselves had a considerable amount of autonomy, and professors were able to exert influence on both state policy and the professions as such. It is the peculiar relationship among state, education and professions to which we now turn.

Higher Education and the Professions:

Between 1860 and 1930 the higher educational system raised the standards for all learned professions, most dramatically for the new professions. It legitimated the professions through a rising amount of study of increasingly complex information over a longer and more arduous course. Working in the opposite direction, however, it had no way to choke off the rising stream of would-be professionals through the system.

The traditional monopoly of the universities over preparation for the recognized and limited professions in 1860 gave way to broader inclusion of non-university higher education by 1930, as in the case of the bestowal of degree-granting rights on the technical colleges. But the universities retained in many ways a model character throughout the period. Efforts both to upgrade the status of non-university tertiary institutions of education in the direction of university-level *Wissenschaft* and the effort to introduce into the universities study programs regarded by many professors as suspiciously "practical" testify to the continuing residual prestige of the traditional university model.

The expansion and diversification of higher education therefore took the form of founding new specialized professional schools instead of incorporating new pedagogical functions into existing universities (or even technical schools). Despite some degree of openness to added pedagogical functions in the 18th century, the universities of the early 19th century rejected the inclusion of "practical" training *(Ausbildung)* and accepted instead a mission of providing almost exclusively "theoretical" training, preceded more and more necessarily by the classical secondary education in the gymnasium. Government educational officials themselves accepted the distinction between this ethically and spiritually superior *Bildung* even as they perceived the need for "practical" higher education. The result was the foundation of technical, agricultural, etc. schools, which were often placed unter the control of such government bureaus as that of commerce.

With the passage of time, these schools evolved into more clearly tertiary institutions, with student bodies of a median age comparable to university students, a more

complex curriculum with the growing introduction of theoretical courses and rising qualifications for the teaching staff. But the pattern of separate institutional creations for new tertiary educational needs was set firmly enough by the 1860s that the universities were never seriously considered as seats for these new departments of applied learning. Such efforts as were made to integrate technological training into the university curriculum were notable for their rarity, and even they encountered discouragingly stiff resistance from the universities themselves.[12]

This continued division between universities and other tertiary educational institutions set parameters for professional self-consciousness among graduates of both types. In the thinking of one important group "after a synthesis [of the two types of education] had failed, disputes over rank, social claims and questions of titles became merely an expression of the independent rise of the engineers, a part of the confrontation between realism and idealism, technology and educational humanism entrenched in traditions."[13]

The culture of *Wissenschaft,* the maintenance and transmission of which the university professors more and more consciously invoked in the late 19th century, was paradoxically being undermined to some degree within the universities themselves. Many contemporaries complained about *Brotstudenten,* who were allegedly intent on acquiring only the minimum of knowledge to pass on into one of the learned professions as rapidly as possible. *Brotstudenten* threatened the professoriate, for the faculties could not very well defend their case against admitting the claims of the emerging *new* professions unless they could maintain in the training of the *old* professions a high level of Humboldt's "purposeless" scholarly and scientific study for its own sake. To use Jamous and Peloille's terms, they sought to introduce a higher degree of "indeterminate" professional knowledge. A good example of this effort may be found in the training and examining of law students.

The guarantee of *Lehrfreiheit* and *Lernfreiheit* (freedom of teaching and learning) in German universities theoretically left the student free to "mold" *(bilden)* his own spirit through his own choice of lectures, readings, and possibly original research. This idiosyncratic confrontation between the student and knowledge was supposed to produce a more flexible, broad and active mind, one ultimately capable of grasping the principles of any subject rather than one limited to a corpus of passively acquired expertise. For professionalization, this kind of education had serious contributions to make: the student could internalize the responsibility and autonomy of professional practice before entering the profession. The student's socialization was in theory more effective for being self-acquired rather than imposed as a "code" from without.

Professions also required minimum common standards of expertise, however, and these were in practice imposed on the aspiring student by his consciousness of the state examinations awaiting him after the university. The lawyer, clergyman and physician had to trim his university courses to the expected pattern of state examina-

12. For an example of one such effort see Karl-Heinz Manegold, *Universität, Technische Hochschule und Industrie. Ein Beitrag zur Emanzipation der Technik im 19. Jahrhundert unter besonderer Berücksichtigung der Bestrebungen Felix Kleins* (Berlin, 1970), esp. Chapter 3.
13. Manegold, 80.

tions. It was well-known to students through rumor and, in some cases, government prescription which professors' courses were "musts" for the successful passage of state examinations. Furthermore, many senior professors were actually members of the state examination commissions, a fact which made their lectures even more compelling.

Despite their reluctance to include new "practical" disciplines, universities were not wholly averse to the acceptance of new "scientific" ones, as Peter Lundgreen has pointed out. Specialization within traditional disciplines ultimately caused the creation of new chairs, seminars and institutes. These in turn sometimes legitimized the claims of practitioners of these new disciplines that they constituted a new profession, or at least a distinct subdivision of a profession. The multiplication of chairs and institutes in chemistry after 1860, for example, was followed by a rising demand for recognition of the graduate chemist. By the mid-1880s, with the increasing importance of the German chemical industry, demands were raised to introduce special state examinations for "academically trained" chemists so as to distinguish this emerging *profession* from the mere *trade* of chemist practiced by people without sufficient academic education.[14] The *Verein Deutscher Chemiker* (German Chemists' Association), led by many chemistry professors, not only began demanding a state examination for chemists in 1896 but came to view chemical education as something best rounded off with an academic doctorate. More professorships and higher standards of instruction constituted other demands by German chemists concerning education.[15]

Still, such recognition of new professional disciplines by the creation of universities' chairs often stumbled over the determined resistance of conservative professors. As late as 1919, for example, the field of sociology was denounced as inappropriate for university study by the historian Georg von Below.[16] New disciplines and specialties such as psychology, psychiatry, public hygiene, social work, pedagogical science and many more struggled with mixed success to find a place in the traditional higher educational system.

In the end, efforts by professors themselves to resist "chartering" new professional specialties could only slow down but not prevent their expansion. Even under the German Empire, but most definitely under the Weimar Republic, such attempts served only to delay the implementation of new chairs and institutes, or to force the establishment of higher educational programs for new disciplines into non-university channels.

A good example of this tendency may be drawn from one of the least successful new professions, public elementary schoolteaching. Dissatisfaction with status, working conditions, and salary was a chronic story in this occupation, but by the end of the 19th century schoolteachers had decided that demanding university education as a career qualification would help alleviate all problems. Finally, after World War I,

14. See H. Ortloff, "Über die Gewerbefreiheit der Chemiker und die Bezahlung ihrer Konsultationen," *Schmollers Jahrbuch*, 9 (1885), 969–71.
15. B. L. P. Rassow, *Geschichte des Vereins deutscher Chemiker* (Leipzig, 1912), 74–7.
16. Georg von Below, "Soziologie als Lehrfach. Kritischer Beitrag zur Hochschulreform," *Schmollers Jahrbuch*, 43 (1919), 1271–1322.

reforms in this direction were begun, but not completed. Instead of sending future elementary schoolteachers to a university just as gymnasium teachers always had been, the old teacher-training institutes were upgraded here and there into "pedagogical academies" the status of which was not really equal to that of universities or technical colleges. The teachers' failure to achieve full academic study damaged their ability to improve their social prestige and incomes right down to the end of our period.[17] By contrast, teachers in higher schools *(Oberlehrer)* were able to increase their status through harder examinations, more semesters of attendance at the universities and more successful lobbying by their organizations. By 1909 they had won their long battle for nominal equivalence in rank with judges and for higher salaries.[18]

The rapid and disproportionate expansion of enrollments in tertiary institutions of all types, marked enough between 1860 and 1900, and stunning thereafter, indicated a potential weakening of professorial control over recruitment into the professions. By general agreement among contemporaries, the rapid expansion involved mostly careerists grasping for professions attainable only by university or other tertiary training. The universities had to admit all qualified secondary school graduates as one part of the Humboldtian heritage, and the professoriate had few effective weapons with which to winnow out unfit or poor students.[19] With the exception of medicine, there were no examinations before students left and controls through seminar or laboratory work could only function if the students submitted to such exercises. Even physical attendance at lectures was uncontrollable in most disciplines, as Gustav Schmoller, a professor of law and economics, complained in 1886.[20] Yet professorial annoyance with class cutting did not lead anybody to suggest obligatory class attendance, for that was held to be a serious breach of academic freedom. Furthermore, greater restrictions on the student body might have reduced the increased lecture-fee income of the professoriate. Thus the faculty members had to choose means of influencing the professional training of students other than external coercion.

The most obvious of these means lay in the example of the professors themselves. The wide acceptance among the professoriate of the idea of *Wissenschaft* as a goal orientation meant that German professors were hired and promoted largely on the basis of their scholarly and scientific productivity. Professors of medicine, law and the natural sciences, for example, contributed to the advance of those disciplines in the broader society with discoveries or, in the case of law, advice to governments on

17. For a full picture of elementary schoolteachers, especially their educational background, see Rainer Bölling, *Volksschullehrer und Politik. Der deutsche Lehrerverein 1918–1933* (Wiesbaden, 1978); Manfred Heinemann (ed.), *Der Lehrer und seine Organisation* (Stuttgart, 1977); and Helmuth Kittel, *Die Entstehung der Pädagogischen Hochschulen, 1926–1932* (Berlin, 1957), a less critical account than Bölling's.
18. Hartmut Titze, "Die soziale und geistige Umbildung des preußischen Oberlehrerstandes von 1870 bis 1914," *Zeitschrift für Pädagogik,* Beiheft 14 (1977), 107–28.
19. For a rather interesting comparison of the German and American systems, with much praise for American hardness toward poorly qualified students, see Heinrich Waentig, "Die amerikanischen Law schools und die Reform des Rechtsunterrichts in Preußen," *Schmollers Jahrbuch,* 26 (1902), 1439–68.
20. Gustav Schmoller, Review of Georges Blondel, *De l'enseignement de droit dans les universites allemandes* (Paris, 1885), in *Schmollers Jahrbuch,* 10 (1886), 613.

the framing of legislation. Theologians and humanists in the universities set the parameters of discussion and research in their fields, with direct effects on the activities of pastors, teachers and publicists. Likewise, professors in the technical colleges made direct contributions to German engineering.

For this reason, the role model of the professor as an examplar of his profession had an important, if unmeasurable, impact on students. In the culture of *Wissenschaft,* the student ideally learned method, not merely the results such method had produced. To be sure, in the increasingly overcrowded German higher educational institutions, not all students could or would avail themselves of the opportunity to learn method in the relatively intimate and demanding arena of the seminar or laboratory course. But for those who did, great opportunities were available for trying their own hand at applying the most advanced methods; and the result, when successful, should have been a heightened degree of professional self-confidence on the part of the students. Did those students whose studies were carried out in close proximity to the professoriate therefore experience different career patterns in their later professions, when compared to the *Brotstudenten,* who did the minimum to gain access to the professions? Clearly in some professions, such as academic teaching, the difference was crucial, whereas in other fields, such as law, it may have been far less significant.

A more concrete influence of the professoriate upon the professional preparation of German students operated through the post-educational institution of examination boards for the professions. Their composition and the nature of the test differed in detail from one profession to another and from one German state to another. They were by law and custom *state* examining boards, so that the states determined in principle who would be appointed to them. The corpus of required professional knowledge was determined in general by government regulations. The boards usually contained a certain number of civil servants whose expertise lay in the area to be examined. For example, officials of the established state churches would sit on examining boards for clergymen; those from the medical departments, on medical examining boards; those from the judiciary or general administrative departments, on boards to examine graduates in the law; and so on. But the professoriate could influence both the composition of the boards and the content of the examinations. On the one hand professors were informally consulted by the government about appointment to boards and regulations concerning examination content, and on the other hand they were actually appointed to the boards themselves.

The formal composition of the boards could range from 100% civil servants, as in the case of the Prussian state examination commissions for lawyers and civil servants down to 1864, to 100% professors, as was traditionally the case for candidates for teaching positions in the universities. The professoriate agitated, sometimes successfully, for greater formal representation of professors on those boards having few or no such examiners. In the case of the legal examining boards, they argued that testing by civil servants alone led to an exaggerated emphasis on practical knowledge to the detriment of theoretical knowledge obtained through higher education in the law. Since the legal examining boards were among the most frequently and vehemently attacked by the German professoriate (and often enough by the legal voluntary organizations such as the *Deutscher Juristentag*), it may be illustrative to dwell on their history at some length.

Certain German states already had by the 1870s examining boards for judges, civil servants *(Verwaltungsbeamte)* and attorneys that were entirely composed of university professors. Württemberg was widely regarded as possessing one of the best of these, and the relative seriousness of the study of law at the University of Tübingen was believed to derive from the professorial nature of the examining commission.[21] Prussia, however, while amending its laws in 1864 and 1869 to provide for a university professor on the legal examining boards, assigned a preponderant influence to the members of the state judiciary and thus to such "practical" expertise as knowledge of how to draft a brief correctly. Law professors complained from the 1870s through the 1920s about the results. These included lax attention to formal university study of the law, reliance by students on private coaches *(Einpauker)* to prepare them for examinations, and a well-deserved public skepticism about the stringency of law examinations and, consequently, the qualifications of those who passed them.[22] Even professors were divided over the question of creating boards solely from professors or from a mixture of professors and civil servants. The German Jurists'Association resolved on a combination of both, thereby criticizing the Prussian practice of overrepresenting non-university legal experts.[23] By the 1920s, the pressure from university professors and the voluntary associations to which they belonged had resulted in somewhat greater influence by professors on North German examining boards, but not enough to satisfy the professoriate. In the eyes of some professors, the inauguration of a codified civil law *(Bürgerliches Gesetzbuch)* for all Germany in 1900 as the basis for most university teaching had merely encouraged students to think in ever more "practical" terms about the law and to overlook the indeterminate side of legal knowledge connected to a broader culture:

> The university should bring before the soul of the student the world of law as a product of culture in a systematic context; it should present law as conditioned by political, economic, ethical, and religious factors; it should show the student—always in a systematic context—how the norms of law dispose themselves around this cultural life and under the standard of justice, and how individual questions fit into the system of law.[24]

The ongoing thrust and parry of "practical" against "theoretical" orientations in legal examinations involved the certification of not just one but several professions departing from legal examinations. The civil service had its own second examination for its young members after a stated period of service, whereas the bar did not. Thus for the sake of the social standing of the German bar, if for no other reason, an examination system that would certify the kind of values mentioned above had more meaning than an easy, publicly-despised one. And German law professors were able

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21. See von Kräwel, "Die einheitliche Regelung unserer ersten juristischen Staatsprüfung," *Schmollers Jahrbuch,* 9 (1885), 512. Other states having a completely professorial examining board by this time included Bavaria, Saxony, and Hesse. Although attorneys were "liberated" from many regulations in 1878, they still had to qualify in the same way as aspirants for judgeships.
22. For a detailed discussion of the situation in the 1870s, see Otto Gierke, "Die juristische Studienordnung," *Schmollers Jahrbuch,* 1 (1877); 1-32; for the 1920s, Ernst Heymann, "Die juristische Studienreform," *Schmollers Jahrbuch,* 46 (1922), 109–161.
23. Von Kräwel, "Die einheitliche Regelung," 516.
24. Heymann, "Juristische Studienreform," 117.

to impress this view on the bar, at least until it began to split in the 1920s: "The elite of the profession consisted of highly competent lawyers steeped in an idealistic conception of their profession and, strange perhaps in as mundane an occupation as the law [sic], in ideals of *Bildung*, of literary culture, and a refined personality."[25] It is perhaps significant that the Weimar Republic brought a heightened consciousness of the division between the traditional court lawyers and the rapidly increasing corporate lawyers. Diminished economic security for many practitioners prompted calls for a *numerus clausus* to limit the number of lawyers—and more demands for heightened professorial powers on the examining boards.

In contrast, the medical faculties in our period had considerably more control over admission to their profession. Not only did they participate more in post-university examining boards, but they insisted on examinations given to aspiring medical students in the middle of their studies. The problem with German medical education therefore does not appear to have lain so much with quality, but with quantity. Most foreign observers gave German medical training high marks and urged emulation by their own countries.[26] But the German medical professional organizations, to which most medical professors belonged, raised their voices ever more loudly after the 1880s against the production of too many M.D.s by the universities.[27]

In at least one case, certification by professors alone could raise complaints that too little attention was being paid to practical knowledge. Graduate economists, whose numbers grew dramatically after World War I, confronted this problem:

> The study of economics in the postwar era has developed into a subject for the masses that culminates in the doctoral examination, especially that of the *Dr. rer. pol.*... On the one hand, a purely scientific examination was devalued; on the other hand, a purely theoretical training in no way sufficed for a practical profession. Professors of economics and economists in the public positions and the private sector took exception to all this.[28]

Such an admission by professors themselves that academic credentials alone (in this case, the doctorate) are inadequate preparation for the professions indicates that professors preferred to influence state examining bodies, not abolish them in favor of a less controllable system of university certification alone.

In addition, the professors had at their disposal the obvious professionalizing tool of curricular determination. The freedom of teaching for the professor was far less circumscribed than the freedom of learning for the profession-bound student. The *venia docendi* of most German professors gave them the right to offer courses on subjects of their choosing. Nevertheless, professors (particularly those with chairs) were

25. Dietrich Rüschemeyer, *Lawyers and Their Society* (Cambridge, MA., 1973), 178.
26. A classic example is found in Abraham Flexner, *Medical Education: A Comparative Study* (New York, 1925).
27. Not only were professors prominent in the League of German Medical Associations *(Deutscher Ärztevereinsbund)*, which was to be expected; they also joined the purely interest-oriented *Leipziger Verein (Hartmann-Bund)* in large numbers. Well over half of German medical professors belonged to it by 1910, according to Bernhard Puppe, *Die Bestrebungen der deutschen Ärzte zu gemeinsamer Wahrnehmung ihrer wirtschaftlichen Interessen* (Wiesbaden, 1911), 21.
28. W. F. Bruck, "Zur Reform des Bildungswesens der Juristen und Volkswirte," *Schmollers Jahrbuch*, 52 (1928), 458.

obliged by their office to lay out systematically the basic knowledge in their field in the course of "public" lectures. Since the chairholders giving these lectures tended to be the leading professional authorities in their institutions, their course content had a heavy impact on the professionalization of students. Given the diversity of the entire German system of higher education, there was no uniform professionalization. Moreover at least those students who availed themselves of the chance, could also take the "private" and specialized courses offered by *Privatdozenten* and *ausserordentliche Professoren* in particular. Along with a constantly growing number of smaller advanced classes such as seminars and "exercises" *(Übungen),* these provided in theory a wider field for the development of professional autonomy. But their number and the quantity of their student clientele did not grow as fast as the general student population, particularly after 1900. Thus it must be concluded that large numbers of students made little use of them and clung instead to the straight and narrow path of professional preparation in the main-line courses. For such students the curriculum thus meant exposure to the *Ordinarien,* whose prestige was also reflected by their highly visible role in the professional organizations of Germany.

Professorial participation in such organizations closes the circle of professional definitions through higher education. Although statistics are difficult to find in secondary literature, a few figures are indicative. In an old profession such as law, legal professors were disproportionately represented in the governing levels of the *Deutscher Juristentag.* Founded chiefly by practitioners, this national organization had by 1900 eight professors out of 20 jurists sitting on the governing board. Of 36 presidents of the organization between 1860 and 1931, no less than 28 were university professors.[29]

Even in the relatively new professions, academic teachers appear to have taken a strong role in voicing the concerns of professional organizations about educational matters. The German Chemists' Society, to name but one example, turned to professors of chemistry for leadership in tightening up recruitment and curriculum in higher education.[30] It is a relative rarity in the annals of professional organizations before 1930 to read pronouncements that professional higher education was "too academic" as members of the League of German Architects (including Taut and Gropius) complained in the 1920s. But even in a case such as this, those who sought fundamental educational reform for private architects were operating from a base in the *Bauhaus* and were themselves teachers.[31]

Although conclusions about the relationship of professionalization and higher education in Germany between 1860 and 1930 must remain very tentative at this stage of research, a few generalizations emerge for further testing. First, the professions themselves grew vigorously in this period, as did their representative organizations. These organizations possessed less unity, singleness of purpose and autonomy than comparable ones in Britain or the United States. In the course of time, many of

29. Deutscher Juristentag, *Verhandlungen des 25. Deutschen Juristentages* (Tübingen, 1900), III, xiii; Ernst von Caemmerer *et al.* (eds.), *Hundert Jahre deutsches Rechtsleben,* 2 vols. (Karlsruhe, 1960), 2, 45ff.

30. Rassow, *Verein deutscher Chemiker,* 74ff.

31. Bernhard Gaber, *Die Entwicklung des Berufsstandes der freischwebenden Architekten dargestellt an der Geschichte des Bundes Deutscher Architekten BDA* (Essen, 1966), 124–8.

them evolved away from preoccupation with the scientific or scholarly basis of their profession and increasingly became lobbies for special interests. As such, they were not *vocally* concerned about higher education (although some concern was always shown). The professional organizations appear to have been generally satisfied with higher educational preparation, with two major exceptions. These were a demand for longer periods of higher education or tighter examination procedures and, after World War I, the call for a *numerus clausus* restriction on admission to higher education as a means of throttling "overcrowding" in the professions. The "new" professions demanded higher education or equal recognition of their special kind of training with that provided by universities, and they were somewhat less concerned about *numerus clausus;* but the tendency remained comparable.

The professional organizations did not need to concern themselves very much with changing higher education because the state guided both the standards of training and the certification of the trained. Despite occasional charges of corruption or at least laxity in this system, most practitioners appear to have accepted the state's monopolistic role. They asked only that examining boards and curricula become themselves more professionalized.

For reasons somewhat exogenous to the professions, the German professoriate had itself adopted a modern professional ethic by the 1870s and led the assault on poor educational preparation for the professions. This was true first in the universities, later in the technical colleges, which emerged as true professional schools toward the end of the 19th century. Since professors came to play a stronger and wider role in the state certification process *and* played a vital role in professional organizations, they were in a position to dominate or at least lead discussion of educational reform. As both state officials and highly respected members of professional organizations, professors were in an excellent position to mediate between the two. Down to 1918, at least, they used this influence to improve professional education and lure greater funding from the states, while also doing little to stem the flood tide of enrollments and qualified professionals pouring through the universities and technical colleges. The result in the 1920s was a well-trained but vastly under-employed professional force that one critic called ominously in 1932 *Doktoren ohne Brot.*[32]

32. Friedrich Maetzel, "Doktoren ohne Brot," *Die Tat,* 23 (1931–2), 1004–11.

Charles E. Timberlake

Higher Learning, the State, and the Professions in Russia*

The enormously complex relationship between higher learning and the professions in Russia from 1860 to 1930 has three major components: (1) the higher educational institutions that trained the professionals; (2) the numbers, organizations, attitudes and competence of these professionals, and (3) the centralized bureaucratic Tsarist and Soviet governments that sought to determine the characteristics of the students who were educated and whom they later employed as civil or military servants. An explanation of the interdependencies of these three facets is complicated by the fact that the Bolshevik Revolution in 1917 prevents the study of these relationships as an unbroken line. While the dominant role played by the central government before and after 1917 is similar, higher educational institutions played a dissimilar role, because other avenues to the professions were opened.

The historically close relationship between the government and the professions has influenced the terms Russians used, and still use, to describe professions. The mixture of Western adjectives, derived from the name of the profession, to modify the uniquely Russian noun denoting a special legal group (e.g., *meditsinskoe soslovie*) gave way after 1917 to a new official division of Soviet society into three "friendly" classes such as the agricultural population, the "proletariat," and the "intelligentsia," a category that includes everyone not within one of the first two groups. All the professions are included in the third "class" and are engaged in "intellectual labor."[1]

Before 1917 the most common word used to denote a social group with a special legal status was the word *soslovie*. By 1860 several strata had acquired this distinc-

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1. For *soslovie,* see note 2, below. For the Soviet use of "three friendly classes," see "Open Letter of the Central Committee of the CPSU to Its Party Organizations at All Levels and to All Its Party Members, July 14, 1963," *Peking Review,* July 26, 1963, 38-39. For "intellectual labor," see V. R. Leikina-Svirskaia, *Intelligentsiia v Rossii vo vtoroi polovine XIX veka* (Moscow, 1971), 70.

tion: the hereditary gentry; personal gentry (those who were promoted to gentry status for service in the civil or military bureaucracy); distinguished citizens; merchants; artisans ("petty bourgeoisie" is the standard Soviet translation); peasants (divided into various categories); clergy, divided into "white" and "black" for priests and monks, respectively, and others. Each of these groups had various privileges, statuses, and rights according to government legislation. For instance, Russian directories compiled before 1917 traditionally had the *soslovie,* or title (lawyer, doctor, etc.), of each person attached to the name. Graduation from a higher institution, therefore, offered not only substantive access to positions and salaries, but had also high visibility in Russian society.[2]

From the 1860s on some professionals sought recognition, protection and advancement of their occupation through having it recognized as a corporative *soslovie.* As a part of the legal reform of November 20, 1864, lawyers acquired such a privileged status under the title "sworn attorneys."[3] Subsequently, other Russians of note pleaded in vain for the creation of a medical *soslovie* for doctors, even after physicians had already begun to refer to themselves as such.[4]

At the same time that the Russians sought terms in their own language, they also borrowed heavily from West European languages. At the first level of distinction in higher learning, they divided higher educational institutions into two types: university *(universitetskoe)* and special *(spetsial'noe)* higher education.[5] The universities were assigned the role of theoretical and research-oriented training (for which the

2. For the origin and use of the term soslovie, see Sergei G. Pushkarev, compiler, *Dictionary of Russian Historical Terms from the Eleventh Century to 1917,* George Vernadsky and Ralph T. Fisher, Jr., eds. (New Haven, 1970), 137-39; N. Lazarevskii, "Sosloviia," *Entsiklopedicheskii slovar* (Brockhaus-Efron), 60: 911-13. The term was also used more loosely to describe "a group of people with a common occupation," although the group might not have a legal, corporate status. *Slovar sovremennogo russkogo literaturnogo iazyka,* Vol. 14 (Moscow-Leningrad, 1963), columns 358-9.
3. M. T., "Prisiazhnye poverennye," *Entsiklopedicheskii slovar,* 49: 261-62. See Samuel Kucherov, *Courts, Lawyers, and Trials Under the Last Three Tsars* (New York, 1953), 127-28 for a brief explanation of the structure of this body.
4. Lazarevskii, "Sosloviia," 913. A doctor wrote to the editor of *Meditsinskii vestnik (Medical Herald),* referring to the medical profession as "our *soslovie,*" for instance, in 1885. Cited by Nancy Frieden in *The Russian Physician, 1856-1905: Professional, Reformer, Radical* (Princeton, 1981), Chapter 5.
5. Government statisticians always collected and published data on Russian education in these separate categories. The results of the educational censuses of March 20, 1880, for instance were printed in separate volumes for the university-gymnasium category and the "special educational institutions." For the universities, two volumes: A. V. Dubrovskii, *Universitety i srednie uchebnye zavedeniia muzhskie i zhenskie v 50-ti guberniiakh Evropeiskoi Rossii i 10-ti guberniiakh Privislianskikh po perepisi 20-go marta 1880 g.* (St. Petersburg, 1888) as *Vremennik Tsentral'nogo komiteta,* Vypusk 1, and A. V. Dubrovskii, same title, St. Petersburg, 1888, as *Statistika rossiiskoi imperii,* Vypusk 3. The data on the special educational institutions were presented in one volume: A. V. Dubrovskii, *Spetsial'nye uchebnye zavedeniia muzhskie i zhenskie v 50-ti guberniiakh Evropeiskoi Rossii i 10-ti guberniiakh Privislianskikh po perepisi 20-go marta 1880 goda.* (St. Petersburg, 1890) as *Statistika rossiiskoi imperii,* Vypusk 8.

Russians had their own term, *nauchnoe*), while the special higher institutions were for teaching more practical skills (the Russians borrowed the word *prakticheskoe*).

The word "profession" *(professiia)* had also made its way from the West into the most extensive and authoritative Russian dictionary by the 1880s, but not as a separate entry. The compiler included the term as merely one in a group of seven words under the main entry, "professor." A profession was defined as "a trade, any *soslovie's* occupation."[6] Under the heading "practices," a word Russians frequently added in parentheses after the term "professions," the same dictionary listed "medical" and "naval" as examples.[7]

As the statement in the guidebooks distinguishing between university and special institutes and the titles of works published before 1917 indicate, the term "profession" and its derivatives were in rather widespread use in Russia by 1917. But the inclusion of "practices" in parentheses after "professions" by the Ministry of Education illustrates that neither of the two terms had been adopted as the clear indicator of persons engaged in the professions before the Revolution.[8] It is therefore necessary to ask: How did the three dimensions of the relationship of higher learning and the professions in Russia interact in practice?

Higher Educational Institutions:

A variety of types of higher educational institutions transmitted higher learning in Russia from 1860 to 1917: universities, academies, institutes, lyceums, "schools," "higher courses," "special courses" and still others with uniquely Russian names. By 1860 the government had already established a major distinction between two basic types into which it grouped the many institutions and courses with their various titles. The first group of institutions, which was under the jurisdiction of the Ministry of Public Education, was composed of the eight "Imperial" universities of Russia and Poland (Warsaw University was created in 1869).[9] The second group of institutions was the higher special institutes within the ministries of the Tsarist government. The purpose in founding and maintaining these special institutes was the training of specialists in the area of applied knowledge.

The most elaborate distinction set forth in print was the Ministry of Education's statement on "The Tasks of the Universities," included in all guidebooks to Russian higher education in 1915:

> The goal of the universities is to give young people a scientific *(nauchnoe)* education. The universities do not prepare people for practical work, with the exception of the faculties of medicine. They do not graduate teachers, lawyers, judges, or civil servants *(chinovniki);* rather, they grad-

6. Vladimir Dal, *Tolkovyi slovar zhivogo velikorusskago iazyka.* III (St. Petersburg, 1882), 523.
7. Dal, 381.
8. See "The Tasks of the Universities" quoted below.
9. The ninth university was in Helsinki, which was not included in educational statistics before the 20th century, because Finland was administered separately. Cf also, *Entsiklopedicheskii slovar,* 15: 291–92 for data on Helsinki University.

uate people who, having received a legal, mathematical, philological or other type of education, and who, having devoted themselves to activities befitting the education they received, will quickly orient themselves in their fields and be capable of utilizing for practical activities the theoretical knowledge they have acquired. The university is a scientific and—in conjunction with that—an educational institution.[10]

Though training in effect professionals, the faculties within the universities were "substantially different" from the specialties represented by a "higher professional school." The special institutes had as their major tasks

giving their students such information and skills as are virtually essential for future workers before entering a particular profession (practice—jurist, engineer, technician, teacher, etc.). The university pursues goals of a purely scientific and general educational character in every branch of science, without regard for or adaptation to the choice of this or that profession its students have made for their future practical life.[11]

The author's concerted effort to make such a clear distinction might well be a result, in part, of the fact that training for the professions had gained such considerable popularity by 1915 that the author felt compelled to defend the theoretical courses of the universities against increasing criticism from practically oriented critics.[12] Nevertheless, the normative description of the differences masks the difficulty of identifying the distinction in practice. The government's own statement exempted medical faculties from the characterization, and the student body of universities with medical schools sometimes included one-half to two-thirds medical students. Conversely, engineering institute graduates constantly complained that their training was so theoretical that they could not apply it when they directed construction projects.[13].

The diversification of types of institutions, the attention of revolutionaries and liberals to the plight of the masses, and the desire of industrialists and bureaucrats in certain ministries for better trained workers and specialists led to the emergence of a broadly based group of advocates for forms of education other than university courses: technical, commercial, industrial and other training. These critics did not seek so much to combat the favorable stereotype of the university as to raise the image of the other types of education dispensed by new institutional types. They also sought and won symbols of status for graduates from those special institutions. Special medallions, uniforms, and civil service ranks were bestowed upon graduates with specific titles from specific institutions to make them visibly unique in public. These adherents formed promotional societies, conducted special studies of advanced tech-

10. D. Margolin, *Spravochnik po vysshemy obrazovaniiu,* 3-oe izdanie (Petrograd, 1915), 35–36; V. I. Vorontintsev, *Polnyi sbornik pravil priema i programm vysshikh, srednykh i nizshikh, obshcheobrazovatel'nykh, spetsial'nykh i professional'nykh uchebnykh zavedenii Rossii, muzhskikh i zhenskikh, pravitel'stvennykh i chastnykh,* 4-oe izdanie (Petrograd, 1915), 44–46.
11. *Ibid.*
12. See *Severnyi vestnik,* 1896, No. 8, for a discussion of "industrial education"; N. Kareev, *Vybor fakulteta: Rukovodstvo dlia uchenikov vysshikh klassov sredneuchebnykh zavedenii,* 3-oe izdanie (St. Petersburg, 1905); Sergei Timoshenko, *As I Remember* (Princeton, 1968), 24–29.
13. Timoshenko, 32.

Table 1: Distribution of University Students by Faculty, 1872

Name of university	Theology	Hist/Philology	Law	Nat. Sci/Math	Medicine	Eastern langs.	Total	Auditors	Total
	Students								
Petersburg	-	99	764	305	-	42	1,210	86	1,296
Moscow	-	97	588	136	532	-	1,353	44	1,397
Khar'kov	-	22	211	56	159	-	448	76	524
Odessa . . .	-	37	240	88	-	-	365	46	411
Kazan . . .	-	61	239	62	169	-	531	56	537
Kiev . . .	-	82	253	59	449	-	843	62	905
Dorpat . . .	87	75	189	91	244	-	686	6	692
Warsaw . . .	-	34	236	87	322	-	679	47	726
Totals	87	507	2,720	884	1,875	42	6,115	423	6,538

Source: A. V. Dubrovskii, Svedeniia po statistike narodnago obrazovaniia v Evropeiskoi Rossii, 1872-1874 (St. Petersburg, 1879), 40.

nical schools in Western Europe and the United States,[14] and one such group set up its own system of schools for technical education.[15]

In some areas the universities and the higher special institutes shared in training professionals; in other areas the special institutes had a monopoly, and in the area of the natural sciences the universities had a monopoly. What were the numbers and types of specializations that higher educational institutions afforded in Russia in the 1870s compared with 1915?

The size and distribution of subject faculties among Russian universities can be determined in 1872, the first year an educational census was taken (Table I). The total possible at any institution was seven, if mathematics and the natural sciences (which are combined in government figures) are counted separately. None of the eight uni-

14. V. A. Kind, *Puti i formy rasprostraneniia professional'nykh znanii* (Petrograd, 1916); "Obshchestva," *Entsiklopedicheskii slovar,* 42: 611; Ministerstvo narodnago prosveshcheniia, *Ocherk razvitiia promyshlennago obrazovaniia v Rossii za 1888-1898 g.g.* (St. Petersburg, 1900), 1-13; "Professional'noe obrazovanie," *Entsiklopedicheskii slovar,* 50: 563-74.

15. The Imperial Russian Technical Society published a list of the schools it had founded and placed under the jurisdiction of Tsarist government. For instance, *Uchilishcha Imperatorskago russkago tekhnicheskago obshchestva: Spravochnaia kniga Postoiannoi kommissii po tekhnicheskomy obrazovaniiu za 1888/89 uchebnyi god* (St. Petersburg, 1889).

Table 2: Distribution of University Students by Faculty, 1880

University (date founded)	Hist/ phil-ology	% of that univ.	Nat Sci/ Math	% of that univ.	Law	% of that univ.	Med.	% of that univ.	Total enroll-ment
St. Petersburg (1819). .	246 (26.9)	15	758 (46.4)	46	641 (35.0)	39	0 (0)	0	1,645 (99.6)*
Moscow (1755)	146 (16.0)	7	253 (15.3)	13	329 (18.0)	18	1,162 (31.3)	62	1,890 (100)
Khar'kov (1805)	65 (7.3)	10	106 (6.7)	17	105 (5.8)	16	361 (10.1)	57	637 (100)
Odessa (1865)	90 (9.8)	26	146 (9.0)	42	109 (6.0)	32	0 (0)	0	345 (100)
Kazan (1804)	70 (7.7)	10	72 (4.4)	10	88 (4.8)	12	476 (12.9)	68	706 (100)
Kiev (1834)	97 (11.2)	9	131 (6.4)	13	147 (8.0)	14	666 (19.2)	64	1,041 (100)
Dorpat (1802) . . . . . (Iuriev after 1892)	151 (17.7)	16	78 (5.1)	8	212 (11.6)	22	525 (13.8)	54	966* (98.4)
Warsaw (1869)	32 (3.4)	5	107 (6.7)	16	198 (10.8)	31	309 (12.7)	48	646 (100)
Totals	897 (100)		1,714 (100)		1,831 (100)		3,499 (100)		7,876*

Source: Leikina-Svirskaia, Intelligentsiia v Rossii, 58.

*Excluded from this table are approximately 30 students in Eastern Languages Faculty of St. Petersburg University and 130 students in theology at Dorpat University.

versities added a faculty before 1917, but some created institutes, special centers *(kabinety),* clinics, laboratories, or other entities to allow for specialization. Most of the adaptations occurred at Moscow University.[16] No university in the Russian Empire had all seven faculties. Closest to that number were Dorpat and Helsinki with the only schools of theology, but both lacked a faculty of Eastern languages; St. Petersburg had the only faculty of Eastern languages, but it had no medical faculty; Odessa lacked a medical faculty until 1900. Every university of the original eight had history/philology, law and mathematics/natural sciences faculties. In sum, the original eight universities contained six medical faculties; eight law faculties; eight history/philology faculties; eight mathematics/natural sciences faculties; one theology faculty, and one faculty of Eastern languages.

Since two universities had no medical faculties, and since nearly one-third of the students were studying medicine in the late 1870s and early 1880s, Russia's six universities with medical faculties were primarily medical schools (Table II). Of those six universities, even Warsaw, with the smallest enrollment in the medical faculty, had 48% of its students studying medicine. Moscow University's medical faculty with 1,162 students, 62% of the student body, was nearly twice as large as the second largest medical faculty, 666 at Kiev. Those two universities trained over one-half of the medical profession—31.3% at Moscow alone (Table II).

Despite the emphasis which the Tsarist bureaucracy placed upon producing doctors, the regime used the universities first of all to train lawyers (Table III). A five-year interval sample from 1865 through 1899 and for 1912 shows an average of 37.9% of the student body studying law. Medicine ranked second with 33.1%; mathematics/physical sciences third with 21.1%, and history/philology fourth with an average of 7.9%. Combined, law and medicine enrolled some 71% of all students trained in Russian universities from 1865 to 1912. Whatever their rhetoric, Russian universities were in effect legal and medical professional schools.

The 1880 census also collected data on special educational institutions.[17] These figures reveal a total of 3561 special institutions with 44,572 male students. Among those institutions, the compiler called 34 (less than 10%) "higher," but provided neither the criteria used to distinguish them from other levels, nor did he divide students into groups attending higher or other levels of institutions (Table IV).[18]

The special educational institutions offered seven areas not covered by universities: training for the clergy, military/naval, surveying, agriculture/forestry, technology (mainly engineering), commerce and the arts. In four areas specialists were trained both by the universities and the higher special institutions: teaching (such as

16. In 1895, Moscow University had 15 special centers (kabinety) for such specializations as fine arts and antiquities, geology, agronomy, forensic medicine, histology; an astronomical observatory, eight laboratories, seven medical clinics, four "barracks" for treating children's diseases, three hospitals, three medical institutes, a botanic garden, and four museums. *Uchebnyia zavedeniia vedomstva ministerstva narodnago prosveshcheniia* (St. Petersburg, 1895), 11-12.
17. The data, except for those in the column on "higher" institutions, are in Dubrovskii, *Spetsial'nye uchebnye zavedeniia ... 20-go marta 1880 g.,* XXX-XXXI.
18. Dubrovskii, X-XI.

Table 3: Distribution of Students by Specialization in Russian Universities 1865-1912 in Percent

	1865	1870	1875	1880	1885	1890	1895	1899	1912	1865-1912
History-Philology	6.5	8.0	9.2	11.3	10.0	6.0	5.1	4.1	10.4	7.9
Natural Sciences/ Mathematics	24.0	17.7	16.8	21.6	20.4	20.1	20.5	23.0	26.0	21.1
Law	48.6	51.2	34.7	23.0	30.5	33.7	37.0	43.0	39.1	37.9
Medicine	20.9	23.1	39.3	44.1	39.1	40.2	37.4	29.9	24.5	33.1
Absolute numbers	4,014	5,951*	5,381	7,941	12,033	12,098	13,797	16,703	38,713	

*Without data from Kazan University

Source: V. R. Leikina-Svirskaia, Intelligentsiia v Rossii, 58-59; Margolin, Spravochnik po vysshemy obrazovaniiu, 9.

history/philology), medicine, law and Eastern languages. The universities had a monopoly in higher level mathematics and the natural sciences, although those two subjects were included at some minimum level in the engineering institutes.

Excluding the four veterinary institutes that the government traditionally listed among them, Russia had only one medical school outside the universities which was considered a "higher" institution: the Military-Medical Academy. Called the Military-Surgical Academy until 1896, it was under the jurisdiction of the Ministry of War and trained army doctors, pharmacists and veterinarians. In the areas of law and Eastern languages, all the special institutions were rated "higher," while only two of the 76 schools training teachers were considered "higher."

Special education for women was largely undeveloped in 1880. Institutions for them existed in only three of the twelve categories: teaching, medicine (mainly midwifery), and the arts. None of those 41 institutions (with 2,840 students) was "higher."[19] Women were, of course, excluded from pursuing degrees in Russian universities throughout the Tsarist period.

Professional Training in Law, Medicine and Engineering:

Student numbers in university faculties can be combined with the corresponding figures for the higher special institutions (except for teacher training where the latter are missing). Their distribution sheds light on the relative importance of the two types of institutions in training a given profession in Russia, and, where data allow, on the contribution of each institution to the total profession. What was the role of the various institutions for the selected professions of law and medicine, and for engineering where the special institutes had a monopoly?

19. Dubrovskii, IL.

Table 4: Special Educational Institutions for Males, 1880

	category	institutions (% total)	"higher" (% total)	students (% total)	teachers (% total)	names of higher ed. institutions
1	parochial	63 (17.5)	5 (15)	13,670 (30.7)	951 (25.1)	Russian Orthodox Academies in SPB, Moscow, Kazan, Kiev; Roman Catholic Academy in SPB
2	pedagogic	76 (21.1)	2 (6)	5,033 (11.3)	509 (13.8)	Historico-Philological Institute in SPB; Historico-Philological Institute in Nezhin
3	medical	36 (10.0)	5 (15)	4,155 (9.3)	352 (9.6)	4 Veterinary Institutes in Khar'kov, Kazan, Dorpat, Warsaw; Military-Medical Academy
4	law and canon law	3 (.09)	3 (9)	658 (1.5)	35 (1.0)	Demidov Law Lyceum in Iaroslavl; Institute of Jurisprudence in SPB; Alexander Lyceum in SPB
5	military	29 (8.0)	5 (15)	6,140 (14)	500 (13.4)	Nicholas Academy of the General Staff; Nicholas Engineering Academy; Michael Artillery Academy; Academy of Military Law; Corps of Pages in SPB
6	naval	40 (11.1)	1 (.03)	1,764 (4.0)	183 (5.0)	Nicholas Naval Academy in SPB
7	surveying	8 (2.2)	1 (.03)	603 (1.4)	46 (1.2)	Konstantine Surveying Institute in Moscow
8	agricultural/ forestry	18 (5.0)	3 (9)	1,615 (3.6)	145 (3.9)	Forestry Institute in SPB; Petrov Agricultural and Forestry Academy near Moscow; New Alexandria Agricultural and Forestry Institute in Liublin province
9	technical/ handicrafts	69 (19.1)	6 (18)	7,794 (17.4)	642 (17.5)	Imperial Technical School in Moscow; Riga Polytechnical School; Technological Institute in SPB; Institute of the Ministry of Transportation in SPB; Institute of Civil Engineers in SPB; Mining Institute in SPB
10	commercial	4 (1.1)	1 (.03)	1,577 (3.5)	104 (2.8)	Practical Academy of Commercial Sciences in Moscow
11	Oriental languages	2 (.06)	2 (5)	33 (.01)	10 (.03)	Lazarevskii Institute of Oriental Languages in Moscow; Academic Department of Oriental Languages in the Asian Department of Ministry of Foreign Affairs
12	artistic	12 (2.4)	0 (0)	1,531 (3.4)	196 (5.3)	None
	Totals	361	34	44,572	3,673	34

In 1880 each of Russia's eight universities had a law faculty with a total enrollment of 1,831 students (23% of all university students). St. Petersburg University had the largest law school, with 641 students (35.8% of all Russian university law students), and Moscow University was second with only half as many students, i.e. 329 (18.2%). In addition three higher special institutions also prepared specialists in the legal profession: the Demidov Law Lyceum in Iaroslavl (under the jurisdiction of the Ministry of Public Education), the Alexander Lyceum in St. Petersburg (under the jurisdiction of the Imperial Chancellery), and the Imperial Institution for the Study of Jurisprudence in St. Petersburg (under the jurisdiction of the Ministry of Justice).[20] The enrollment of 658 in the three special law schools combined with the 1,831 university law students makes a total of 2,489 with 73.5% in universities and 26.5% in the special schools. Of the total number studying law in the Russian Empire, St. Petersburg University had slightly more than one of every four (25.7%). However, as its medical enrollment declined, Moscow University had by 1900 graduated approximately the same number of lawyers (6,523) as St. Petersburg (6,284) since 1856 and 1858, respectively.[21]

Among the special law schools, the Imperial Institution for the Study of Jurisprudence was the most prestigious for state service. Only sons of hereditary or personal gentry were admitted to the former, while the sons of those two *sosloviia* also dominated in the St. Petersburg university law faculty. If one had no contacts at Court and had to rely upon the educational institutions, the best route to state service in the 1860s and 1870s was through a one of the many classical gymnasia and then through the Imperial Institution for the Study of Jurisprudence or the Alexander Lyceum. Graduates of those two institutions entered state civil service at Rank IX. The next best path led, at the higher level, through the Demidov Law Lyceum or the law faculty of St. Petersburg University. The law faculty of one of the other universities was only a third choice. Of course, each law faculty had its own reputation among the eight universities, and its graduates entered state service at the same rank (X and XII) as those of the Demidov school (Table VI). However, St. Petersburg was the goal to which young gentry sons aspired and into which their fathers pushed them when intending a career in state civil service.[22]

Between 1880 and 1915, two additional law schools were created for men. Tomsk University added a law faculty in 1898, and the University Courses inside the Nicholas Lyceum (also known as Katkov Lyceum) in Moscow were elevated to the "higher" level in 1893.[23] Private citizens also created law schools during that same period—some for women—so that by 1915 Russia had a total of 16 law schools (excluding Finland), three of which were for women (Table V).

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20. *Spisok uchebnykh zavedenii vedomstva Ministerstva narodnago prosveshcheniia za 1883/84 uchebnyii god* (St. Petersburg, 1883), 1; Margolin, *Spravochnik po vysshemy obrazovaniiu*, 85.
21. Leikina-Svirskaia, 77.
22. Walter M. Pintner, "The Social Characteristics of the Early Nineteenth-Century Russian Bureaucracy," *Slavic Review*, 29 (1970), 440, *n.* 19; Leikina-Svirskaia, 78; W. Pintner, "The Russian Higher Civil Service on the Eve of the 'Great Reforms,'" *Journal of Social History*, 8 (1975), 55-68; Richard Wortman, *The Development of a Russian Legal Consciousness* (Princeton, 1976), 38-50.
23. *Uchebnyiia zavedeniia vedomstva Ministerstva narodnago prosveshcheniia, 1895*, 21; Margolin, *Spravochnik po vysshemy obrazovaniiu*, 85-89.

Table 5: Russian Higher Educational Institutions, 1915

categories of institutions (all arbitrarily listed here as "schools")	Men	Women	Coed	Totals
universities	11	-	1	12
nonuniversity higher educational institutions of a general nature	-	25	18	43
religious schools (7)				
Russian Orthodox	4	1	-	5
Armenian	1	-	-	1
Roman Catholic	1	-	-	1
law schools	4 [9]	3	-	7 [16]
historical-philological schools	7 [9]	5	2	14 [23]
veterinary schools	4	-	-	4
technical schools (including engineering)	15	6	11	32
agriculture and forestry schools	4	8	3	15
military schools (including engineering, military academies)	23	-	-	23
medical schools (including dental, pharmacy, feldsher schools)	1 [10]	14	14	20 [39]
music and fine arts schools	-	-	11	11
statistics courses and commercial schools	-	-	8	8
Totals	75	62	68	205

Sources: V. I. Vorontintsev, Polnyi sbornik pravil priema i programm vysshikh . . . uchebnykh zavedenii Rossii, 4-oe izd. (Petrograd, 1915); D. Margolin, Spravochnik po vysshemy obrazovaniiu (P-grd, 1915)

[ ] Indicates number of schools in the category that were within universities. In totals, represents the total in the category if schools in the category located within universities were added to those outside universities.

Of the total of 205, 55 were private; 54 were under the jurisdiction of the Ministry of Education; the remainder (96) were under the jurisdiction of other government agencies.

If departments within universities were included in the total, the number would be approximately the same, for every university, except St. Petersburg had a medical school. Every university had a law school. Two universities had no history-philology department.

The Soviet scholar V. R. Leikina-Svirskaia has calculated that between approximately 1856 and 1900, Russia's eight university law faculties graduated some 23,576 lawyers.[24] Adding an estimated number that received degrees in the special law schools, produces a figure of some 30,000 law degrees granted by Russian higher educational institutions from 1856 to 1900. The universities dominated numerically 78.6% to 21.4% but ranked second qualitatively in the government's preference for civil servants. The actual number of practitioners (subtracting deaths of degree-holders, adding numbers who obtained degrees abroad, and so forth) at any date is very difficult to determine. M. Ostrogorskii tried to include everyone practicing law in his *Judical List (Iuridicheskii kalendar)* for 1914, but the numbers of 5,658 lawyers and 5,489 lawyers-in-training are surely too low.[25]

With the addition of the medical faculty at Tomsk University in 1888, at Odessa University in 1900 and at Saratov University in 1909, Russia had nine university medical faculties at its ten universities and one special, non-university medical school (the Military-Medical Academy) by 1915.[26] All enrolled only men. Some fourteen medical schools (including dental, pharmacy and *feldsher* schools) were founded for women between 1880 and 1915, mostly by private initiative, and women could enroll in an additional fourteen schools that were coeducational (Table V). By 1915 Russia had approximately 38 medical schools, including the universities, that were considered "higher" educational institutions.

From 1856 to 1900 the university medical faculties graduated approximetely 21,873 male medical specialists (doctors and pharmacists), some 80.8% of the total. The Military-Medical Academy produced some 5,200 male medical specialists (doctors, pharmacists and veterinarians) or 19.2% of the total. If one excludes veterinarians from the Academy's total, the share of specialists in human medicine who graduated from the university medical faculties would be closer to 90%. Moscow University graduated 8,100 doctors, or more than 37% of all university medical degrees. If veterinary degrees granted by the Military-Medical Academy are included, Moscow University still accounted for nearly one of every three medical specialists trained in the Russian Empire.[27]

The number of physicians practicing in a given year is difficult to determine. The census of 1897 listed some 17,000 doctors.[28] *The Russian Medical List* for 1916 listed some 33,382 practicing doctors (28,366 male, 5,016 female), 8,524 veterinarians (5,705 "with the right to practice," 2,819 "county" and "city" veterinarians), 7,772 dentists, and 6,564 pharmacists.[29]

Despite numerous entreaties to admit women to medical schools during the last 60 years of Imperial Russia, the government refused to open the universities or the Mili-

24. Leikina-Svirskaia, 77–78.
25. M. Ostrogorskii, *Iuridicheskii kalendar* (Petrograd, 1914), 501.
26. Leikina-Svirskaia, 136.
27. Calculations are based on numbers in Leikina-Svirskaia, 141.
28. *Ibid.*
29. *Rossiiskii meditsinskii spisok, izdannyi Upravleniem glavnago vrachebnago inspektora M. V. Del, Na 1916 god.* (Petrograd, 1916). My calculations are approximate, found by ascertaining the average number of names per page and multiplying by the number of pages. The list of doctors, for instance, fills 668 pages.

tary-Medical Academy to them except for a brief period in which the latter taught midwifery.[30] In the 1870s and 1880s many Russian women were forced to go to Western Europe to study medicine, but in the 1890s many private medical schools were opened for them in Russia. Although the Ministry of Public Education had nominal jurisdiction, that agency provided little or no funding except for salaries of required officials. Private donors, including zemstvos and city dumas, maintained these institutions throughout the Tsarist period. In 1888 the government allowed women to become pharmacists with the title of "assistant pharmacist." In 1897 those who completed the course at the Women's Medical Institute in St. Petersburg received the title "woman-doctor," and the right to practice medicine and work in the medical civil service. However, women were denied the civil service rights afforded to men with the same job.[31] After 1900, the graduates of the Women's Medical Institute received the same title and rights as male graduates of the medical faculties of the universities and the Military-Medical Academy. Those who had earned their degrees abroad at a school equal in quality to the Women's Medical Institute in St. Petersburg could convert them into the Russian title of graduate of that institute. Nevertheless, women still could not hold any rank in the Table of Ranks.[32]

The special educational institutions had a monopoly on training engineers, although, of course, a university-educated chemist or other natural scientist could seek employment as an engineer if he wished. Engineers were trained in only six higher educational institutions in 1880 (Table IV). Numbers and types of institutions expanded very rapidly from 1880 to 1915 so that by World War One Russia had 32 higher technical institutions (Table V). Of the approximately 85,000 persons who received academic degrees from 1860 to 1900, some 16,750 (19.7%) were graduates of technical institutes.[33] Whereas no technical institution had been open to women in 1880, six were for women in 1915, and eleven others were coeducational, but, fifteen of the most prestigious were still closed to females. In addition to diversification of types and expansion of numbers within the technical category, the military/naval schools were also moving into new specializations. Besides schools of artillery, engineering and geography, the Ministry of War had founded a school of aviation in Sevastopol by 1915.[34]

Among the approximately 16,750 technical degrees granted by 1900, some 3,800 (23%) were agronomists and foresters; others were mainly various types of engineers in transportation, mining, civil and surveying; 256 were electrical engineers.[35] Enrollment increased dramatically in the technical institutes from 1900 to 1917 (Table 5 in Alston), and by the eve of the Bolshevik Revolution, Russia had approximately 15,000 practicing engineers.[36]

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30. Leikina-Svirskaia, 138–39.
31. *Ibid.*
32. N. G. Freiberg, *Vrachebno-sanitarnoe zakonodatel'stvo v Rossii,* 2-oe izd. (St. Petersburg, 1908), 74–77; Margolin, 281, 327–44.
33. Leikina-Svirskaia, 60–70 has the number of graduates.
34. Margolin, 279.
35. Leikina-Svirskaia, 69–70.
36. Kendall Bailes, *Technology and Society under Lenin and Stalin: Origins of the Soviet Technical Intelligentsia, 1917–1941* (Princeton, 1978), 22.

Throughout the period of 1860 to 1930, the Tsarist or Soviet government controlled access to the professions. It determined the number and types of higher educational institutions to be established; the numbers of students to be admitted and their distribution among the faculties; and the social origin, religious affiliation, political attitudes and gender of the future professionals. Through the Minister (later Kommissar) of Education, it determined the curriculum and examined the graduates who had completed their coursework. After certifying the students' competence, the government employed virtually all of them and ranked them in hierarchical order, depending upon academic degree—with allowances for social origin or political loyalty.

The first means for regulating access to the professions was the control over the institutions that trained the future professionals. Each university and institute was created by a separate Imperial charter that included detailed rules and regulations by which the institution had to be administered. The administrators and teachers were state employees with fixed positions in the civil service Table of Ranks. The government determined the total number of students to be admitted to a university or institute and fixed the entrance requirements. These prerequisites were so specific, and the number of secondary schools preparing students for the university so few that the government often listed individually the names of the gymnasia or special schools whose graduates were admitted to the university without examination. Other students could be admitted by passing special tests. Similar entrance requirements were established for the special institutes, but admission by examination was most common for the highly specialized engineering institutes.[37]

The Tsarist educational bureaucracy considered the universities the elite institutions among its educational system. It expected great scientific achievements from their students and faculties, but it feared at the same time that Western ideas would contaminate academics. In contrast, the officials were less afraid of the special institutes. The difference in emphasis upon the role of ideas and pure learning at the universities and upon applied knowledge in the institutes seems to have been the main reason for the distinction. Events proved the distinction unfounded, and the institutions equally threatening.

In 1863 the government revised the uniform internal administrative structure and set of rules for the seven universities then in existence. (Warsaw University was created six years later but also administered primarily along these lines.) While the University Statute of 1863 allowed for a good deal of autonomy for each university, it retained the principle of legislating for the universities as a group. That practice guided the revision of the statute in 1884 which reduced university autonomy. Under close government scrutiny, uniform regulations, and general government suspicion, the universities became less capable of change and less responsive to the needs of society. A specific faculty might be allowed some choice in how it taught a course, but

37. Vorontintsev and Margolin include the full details of requirements for admission to each institution listed. Admission to the Electrotechnical Institute of Emperor Alexander III was, for instance, by examination only, with specific prerequisites set for taking the test. Margolin, 191-93; Vorontintsev, 139-47.

the curriculum was prescribed by legislation, and the Ministry of Education appointed committees to examine students on the content of their coursework.

The government chose to meet social needs by adapting its special educational institutions or building new ones, not by adding new faculties to its universities. When it determined that it required electrical engineers, it created the Electrical Engineering Institute in 1891, offered lucrative stipends to its students, granted them greater military service exemptions than to university students, and offered high civil service rank to all who did well on the state examinations at the conclusion of their coursework in the institute.[38] Despite a very strong lobbying effort by the Moscow Agricultural Society to have an agronomy faculty created within the universities, the Tsarist education officials retained agronomy as merely one of the specialties within the faculty of physical sciences.[39] Even when private citiziens began a vigorous campaign to found higher special educational institutions from approximately 1885 to 1915, the government retained its right to examine the graduates and to determine their titles, and ranks, if any, should they enter civil service.[40]

Since the Ministry of Education or another ministry had the right to certify professionals, it kept that power out of the hands of the universities and professional organizations. The University Statute of 1863 had specified that the government would use the academic degree or title granted by the universities as its basis for determining the rank specialists would receive upon entry into state service.[41] But the University Statute of 1884 established a separate set of state examinations, conducted by an examining committee named by the Minister of Education, in addition to academic tests required for completing a university degree. University graduates who passed the state examinations would then receive Rank X or Rank XII upon entering state service, depending upon their performance on that state examination (Table VI).[42]

The special institutes continued to function upon the basis of their individual charters. Their graduates were also examined by a committee named by the Minister of Education or, in some cases when an institution was under the jurisdiction of another ministry, by the respective minister. In either case, the number of courses and areas of coursework included in the examination; the score required on each course test; and the exact titles earned by various numbers of points scored on the examination were all fixed by the institution's charter. When an institute graduate entered government service, his civil service rank was determined by the exact title which the

38. *Ibid.*
39. Moskovskoe Obshchestvo Sel'skago Khoziaistva. *Universitet i agronomiia: Sbornik statei i materialov,* Chast I (Moscow, 1916), 5–42 contains an account of the Moscow Agricultural Society's campaign to establish a separate agronomy faculty as well as of the conference held in Moscow in April 1915.
40. Vorontintsev lists the rights of graduates for each private higher educational institution on 393–97.
41. Paul Miliukov, "Universitety v Rossii," *Entsiklopedicheskii slovar,* 68: 793; G. I. Fedkin, *Pravovye voprosy organizatsii nauchnoi raboty v SSSR* (Moscow, 1958), 222.
42. "Obshchii Ustav Imperatorskikh Rossiiskikh Universitetov," *Polnoe sobranie zakonov Rossiiskoi imperii,* Sobranie 3-oe, Tom IV (1884) (St. Petersburg, 1887), 456; A man with a master's degree entered at Rank IX, with the degree of *doktor,* at Rank VIII, *ibid.*

Table 6: Civil Service Rank for Academic Degrees, 1915

RANK	UNIVERSITY	SPECIAL INSTITUTES
I		
II		
III		
IV		
V		
VI		
VII		
VIII	Doctor (Academic degree from any university)	Doctor (Academic degree from any spiritual academy)
IX	Master (Academic degree from any university)	Master (spiritual academy); [graduate with highest title (of 3)] (Imperial Alexander Lyceum; or Imperial Institution for Study of Jurisprudence)
X	All university graduates with diplomas of first quality Candidate (Warsaw and Iuriev Universities)	Engineers (11 types); Agronomists (3 types); Foresters (2 types); Veterinarian (1 type); Lawyers (2 types); Teacher (2 types); Economists (1 type); Medical specialists (2); Clergymen (1 type); Linguists (1 type)
XI		
XII	All university graduates with diplomas of second quality Students with certificates (Warsaw and Iuriev Universities)	Engineers and Technicians (12 types); Agronomists (2 types); Foresters (2 types); Lawyers (1 type); Economists/ Commercial specialists (1 type); Clergymen (1 type); All graduates of certain institutions not in Rank X
XIII		
XIV		Engineers and Technicians (3 types); Economists/Commercial specialists (1 type)

graduate received from the institute. It was, in turn, governed by his performance on the state examination.[43]

Hiring professionals was an important means by which the government could encourage or discourage growth or organization of an occupation. Employment meant not only making career opportunities available. Civil service also included handsome salaries and fringe benefits such as pensions, housing, the right to invest in mutual funds, as well as social status through the right to wear uniforms and medals, and the use of titles or military service exemptions.[44]

Because of the many advantages of state service, the institutions created by the Great Reforms (the zemstvos, city dumas, judicial institutions) and private enterprises sometimes could not compete with the Tsarist government for specialists except in salary. Recognizing this advantage and wishing to promote many of the activities of the zemstvos or city dumas (founding hospitals and pharmacies, hiring agronomists, veterinarians and others) and private enterprises (especially railroad companies), the Tsarist government extended civil service benefits to selected employees of those institutions and enterprises.[45] As a result the distinction between the "private" and "public" sector in Russian society was blurred. Many persons employed in private enterprises saw themselves as rendering a public service. That distinction never developed in Russia to the extent it did in the West, and the degree to which such a consciousness existed by 1917 diminished considerably when the Bolsheviks declared it "bourgeois," i.e., unacceptable.

In an attempt to adapt its antiquated civil service code to the growth of the professions, the Tsarist government added new columns filled with titles of the new professionals to the Table of Ranks (Table VI). The three columns of the original Table of Ranks (not shown in Table VI) are lists of German terms in use when Peter the Great borrowed them in 1722 to create the Table. The titles in columns added in the 19th century reflect borrowings from the West more than a century later. The Table of Ranks shown in Table VI reveals that, at least in rating the quality of its own employees, the Tsarist government ignored the distinction it set forth in the guidebooks to higher educational institutions in 1915 between the superior training provided in the universities and the practical education of the special institutes. It rated the "best" degree granted by the universities and the institutes evenly at Rank X, and it rated the second-best degree granted by each evenly at Rank XII.

The Professions:

Educated in government-founded and government-controlled institutions, certified as competent by government-appointed examining boards (after 1884), placed into hierarchies of academic degrees and civil service ranks by the examining boards, and primarily employed in government service, the professional in Tsarist Russia could not escape government tutelage after graduation. As a practicing professional, he could not gather with fellow practitioners to set standards of competence or professional ethics, or merely to engage in group discussions about ways to solve practical

43. Vorontintsev, 140-45.
44. "Sluzhba gosudarstvennaia," *Entsiklopedicheskii slovar,* 59: 441-42.
45. *Ibid.*

professional problems unless he received official permission for such a meeting. Once a permit was secured from the proper authority, the ministry had to approve the program of speakers and topics in advance.

Despite insistence upon superintending the acts of all its citizens, the Tsarist government approved charters for a large number of societies. In addition to allowing several private societies to form in the 1850s and early 1860s, the government permitted the founding of nearly 50 academic societies within higher educational institutions from 1863 to 1917. The University Statute of 1863 granted universities the right to create scholarly *(uchennye)* societies with membership open to university and non-university personnel. While restricting university autonomy in many ways, the new university statute of 1884 nonetheless continued this right to establish such associations.

By 1895 Russia's nine universities had founded 38 scholarly societies.[46] Moscow University had nine, St. Petersburg seven, Kazan six, Kiev five, Kharkov four, Warsaw three, Odessa two, and Dorpat and Tomsk one each. The 38 societies may be grouped into the following five categories:

twelve in history (including natural history), philology, archaeology, anthropology, ethnography (six universities had at least one of these societies);

four in law (St. Petersburg, Moscow, Kazan and Kiev);

fourteen in mathematics and physical sciences (all universities had at least one of these societies);

seven in medicine (two each at Moscow and Kazan, and one each at Kiev, Warsaw, and Tomsk);

and one in art (at Warsaw).

Those Russian professionals who established corporate bodies resembling their counterparts in Western Europe utilized one or a combination of these government-approved academic societies as an organizing center for the profession. For instance medicine, law, and engineering used university and institute societies, with varying degrees of success, to form national associations.

Russian lawyers were the first group to attempt coordination at the national level. The Moscow Legal Society in Moscow University petitioned the Tsarist government for permission to convene "the first congress of Russian lawyers" in 1874 to initiate a series of periodic congresses of Russian lawyers. Intending to focus upon the theoretical problems of the legal profession, they modeled their congress and its program upon the congress of German lawyers, the *Deutsche Juristentag,* that had met since 1860 in various German cities and had published the proceedings in a multivolume series.[47] The Minister of Education approved this proposal merely as "an experiment," not as the first in a series of periodic events. He insisted upon a separate petition for each new meeting and the right to approve the content of each program in advance.[48]

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46. Compiled from *Uchebnyia zavedeniia vedomstva Ministerstva narodnago prosveshcheniia za 1895* (St. Petersburg, 1895), 10–18.
47. *Pervyi s"ezd russkikh iuristov v Moskve v 1875 godu* (Moscow, 1882), i–iii.
48. *Pervyi s"ezd,* 2.

This Moscow Legal Society sought to unite lawyers and jurists (whom the Statute of November 20, 1864 had already formed into regional corporate bodies for each judical district) with law graduates working in the St. Petersburg bureaucracy and with university law professors and legal scholars throughout the country. The Moscow society requested that the ministers of education and justice invite their colleagues to attend the conference. On its own it sent personal letters of invitation to all Senators of the Cassation and Laws *(Sudebnyi)* Departments of the Governing Senate, chairmen of judical districts and circuit courts, procurators of the legal chambers and their assistants, procurators of the circuit courts, chairmen of the united chambers and provincial courts, provincial procurators, chairmen of the councils of "sworn attorneys" (the Russian bar), honorary members of the Judical Society, professors of law in Russian universities, famous Russian legal scholars, and legal officials of the government's higher administrative organs. Through Russian newspapers and other periodicals it also publicized the meeting as broadly as possible. The society petitioned the rector of Moscow University and the Superintendent of the Moscow Educational District to allow the congress to meet in one of the university's buildings. The Moscow Legal Society would determine whom to allow to attend and would send them passes.[49]

The "first congress," attended by 228 lawyers, met from June 5 through 8, 1875, at Moscow University.[50] The program was that of a typical professional convention. Well-known scholars and practitioners delivered papers which were discussed by the participants. The speakers, nonetheless, could not—and did not attempt to—separate the practice of law from the effect of legislation upon the law. They advised the government not only in legislative matters, but also about the publication of the revised and supplemented *Code of Russian Laws* scheduled for the following year.[51]

Because of this congress, and because of the independent expressions and activities of members of the Moscow Legal Society in the 1880s and 1890s, the Tsarist government abolished the society in 1899. Among its members had been some of Russia's most prestigious and popular lawyers and university law professors. The last chairman of the society was, for instance, S. A. Muromtsev who was later elected president of the First State Duma in 1906.[52]

After the closing of the Moscow Legal Society, the St. Petersburg Legal Society (founded 1877) became the organizing center for the legal profession. Focusing more on the practical application of the law than its predecessor, this society combined many jurists in the Tsarist administration as well as lawyers and university scholars in St. Petersburg. Among its most famous members were A. F. Koni and K. K. Arsenev. It also published the leading legal journals, under a variety of titles, the best known of which was *Vestnik prava* beginning in 1907. Time and again it attempted to obtain permission from the Minister of Education to convene a second congress of Russian lawyers, but the Ministry of Education always rejected the petition on the

49. *Pervyi s"ezd,* 2-3.
50. *Pervyi s"ezd,* 17-24 is a list of those present.
51. *Pervyi s"ezd,* 49-59.
52. "Iuridicheskoe obshchestvo," *Entsiklopedicheskii slovar,* 4/d: 914.

ground that such a congress was "inopportune."[53] The St. Petersburg Legal Society also supplied the Duma and the State Council with some of their most gifted orators and legal minds between 1906 and 1917. But, lawyers never succeeded in forming a permanent national corporate body in Russia.

The medical profession used the same devices in trying to organize a national professional association. Utilizing a variety of practical and scholarly societies as bases for contact and for publishing scholarly articles and news of the various groups' activities, the medical specialists maintained some awareness of the events in the profession outside the geographic area of their own society. The more prestigious of these, most of which were located in Moscow University with its large medical staff and advanced facilities, became focal points for medical specialists throughout Russia. They sponsored periodicals serving the entire medical profession's readership and provided news about the activities of the various societies. Besides the seven scholarly medical societies within Russian universities noted above, many "societies of Russian doctors" existed in Russian cities without universities. The author of one organizational survey in 1897 counted more than 60 societies in some 57 cities in the Russian Empire, including Finland.[54]

Russian doctors also had an additional set of professional relationships upon which to build national unity. The Zemstvo Statue of January 1, 1864, created zemstvo institutions empowered to build hospitals and clinics, establish pharmacies, and untertake other medical aid for the population. Once doctors were employed to staff these medical institutions, the zemstvo in a province would convene a "congress of zemstvo doctors," to plan measures to deal with a particular threat to health such as an outbreak of cholera or the plague.[55]

With the rapid expansion of zemstvo medical facilities and diversification of types of medical care, the zemstvos began employing doctors with a wide variety of specialties. When universities were located near zemstvo clinics, zemstvo doctors began participating also in the scholarly medical societies. This link is particularly clear in the case of doctors working in psychiatric wards of zemstvo hospitals and participating in the Society of Neuropathologists and Psychiatrists in Moscow and Kazan Universities.[56]

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53. *Ibid. Iuridicheskoe obshchestvo pri Imperatorskom S.-Peterburgskom Universitete za dvadtsat' piat' let (1877–1902)* (St. Petersburg, 1902), 49–59 for efforts to unite Russian jurists; 113–164 for list of members; *S.-Peterburgskoe iuridicheskoe obshechstvo (1877–1887)* (St. Petersburg, 1887), various pagination.
54. "Obshchestva meditsinskiia v Rossii," *Entsiklopedicheskii slovar,* 42: 621.
55. For instance, the zemstvo doctors in Chernigov Province held a "congress" in 1878 to prepare mesasures to combat the outbreak of the plague. *Zemskii sbornik Chernigovskoi gubernii* (Chernigov, 1879).
56. V. I. Iakovenko, "Obzor deiatel'nosti vsekh Zemstv po prizreniiu dushevno-bol'nykh so vremeni peredachi im bol'nits Prikazami Obshchestvennago Prizreniia," *Arkhiv psikhiatrii, neirologii i sudebnoi psikhopatologii,* Vol. XXIX, no. 2 (1897), 1–84. Pages 13–62 contain a chronological list of activities of all zemstvos concerning psychiatric care. These data demonstrate clearly that the zemstvos hired large numbers of medical personnel to treat the mentally ill in zemstvo hospitals or in other facilities.

The unification of zemstvo doctors outside Moscow Province, zemstvo doctors in Moscow and professors in medical schools produced the first national association of doctors in Moscow in 1882: The Russian Surgical Society in Memory of N. I. Pirogov, the late professor of medicine at Moscow University. Holding conferences every two years, beginning in 1885, and publishing its papers, the Pirogov Society escaped the prohibitions that the Minister of Education imposed upon the legal societies after their first meeting in 1875. Russian doctors bolstered their international prestige by hosting the XII International Congress of Doctors in Moscow in 1897.[57] The Pirogov Society even survived to experience the Bolshevik Revolution.

The last of the three groups under consideration to form a corporate organization were the Russian engineers. They, too, organized themselves by combining government-chartered societies and groups utilizing higher educational institutions. Among the most important early societies was the society of technologists. Formed in 1884, it sought to locate jobs for technicians, provide support for needy members and their families, increase cooperation between factory owners and engineers, and to cooperate to solve technical problems. It began publishing a journal in 1894, and by 1897 had acquired 1,032 members and a capital fund of 107,100 rubles.[58]

By 1910 nine major societies had been formed, which had a collective membership of 6,520 persons by 1914. In 1915 the famous Russian geochemist V. I. Vernadsky succeeded in founding the Commission for the Study of Scientific-Productive Forces within the Russian Academy of Sciences as forum for cooperation between scientists and engineers.[59] However, not until May 1917, after the fall of the monarchy, did the Russian engineers finally succeed in establishing a national organization, the All-Russian Union of Engineers.[60]

Soviet Policies:

The Bolsheviks wanted to impose a social revolution that would have swept away the privileged "bourgeois" specialists inherited from the Tsarist period, but they were in desperate need of their skills to defend the revolution against its opponents and to solve the country's myriad problems. Therefore they were forced to seek the temporary support, or at least neutrality, of the professionals. Because they were products of strong central control of the educational institutions and of state employment, Russian professional organizations did not adopt resolutions that constituted frontal attacks on Bolshevik one-party rule. Although the members of professional societies apparently favored in large numbers the Constituent Assembly, rather than the Bolshevik coup d'etat in October 1917, they disagreed about the political role that a professional organization should play in the Soviet state.

57. *Vrach* carried articles in almost every issue about the organization of the conference, government dissatisfaction with it, and its results. See Nancy Frieden, *The Russian Physician* (Princeton, 1981), for the formation and activities of the Pirogov Society. 1885–1905.
58. "Obshchestva," *Entsiklopedicheskii slovar,* 42: 611.
59. Bailes, 41. See James McClelland, *Autocrats and Academics: Education, Culture, and Society in Tsarist Russia* (Chicago, 1979), 66–67, 86–90 for the role by Vernadsky.
60. Bailes, 19–20, 42.

The lawyers fared least well during the first years of Bolshevik rule, for they were identified more closely with the old order than were the doctors and engineers. Through Decree Number One on November 24, 1917, some two weeks after the seizure of power, the Bolsheviks abolished all existing judical institutions and the groups of "sworn attorneys" that were tied to them. When the Senate ruled the decree illegal and the Petrograd Bar (soon followed by bars in several other cities) voted it not binding because it was issued by "an incompetent government," the Bolsheviks used the force of the Military-Revolutionary Committee in Petrograd and the Red Guard in Moscow to eliminate them.[61] Since the Petrograd Bar was not formally linked to institutions from the Tsarist period, the Bolsheviks allowed it to exist until November 1918. At that time they occupied the office of the Bar, requested the Executive Council to transfer the Bar's members to a new Bolshevik-created-and-dominated professional body, and permitted the Bar one final meeting of its General Assembly of members to discuss the proposed transfer. Rather than to surrender to Bolshevik control, the General Assembly voted to dissolve the Bar.[62]

The Bolsheviks were more successful in courting the doctors and engineers. Although a doctor or engineer might have worked in a private factory or zemstvo hospital that was nationalized, he continued to perform his same job. He merely worked for a new owner. Despite some open opposition by members of the Pirogov Society and the All-Russian Society of Engineers against the Bolsheviks that led to the death or imprisonment of some individuals, the two societies did not take group action against the new regime. In fact, Bosheviks frequently released members of the Engineers' Society from jail upon petition from the Society.[63]

By the end of the Civil War in 1921, the Bolsheviks had broken up some professional organizations or transferred their members to Party-controlled groups and had established working relationships with others. During the New Economic Policy (NEP) from 1921 to 1928, the Party made even greater efforts to reintegrate the existing supply of professionals into the economy to help recover from the disasters of seven preceeding years of war, revolution and Civil War. Industrial output in Russia in 1921 had fallen far below its prewar level of 1914; famine and cholera epidemics ravaged the countryside; fields were neither planted nor harvested; factories sat idle, oil was poured over their machinery to prevent rust.[64] Turning to the technicians and restoring for them some of their former privileges, the Bosheviks allowed these specialists (whom they called *spetsy*) to resume their practices, re-employed those with technical skills in managerial roles in factories, and paid them a wage out of proportion to that enjoyed by lesser skilled workers. To supplement the insufficient domestic supply of professionals, the Bolsheviks appealed abroad for foreign specialists and skilled workers to come to Russia. The government offered to hire them directly for a wage and to grant concessions to foreign private enterprises that would send their own professionals to Russia. It also granted concessions of land and factories to

61. Kucherov, 314–15.
62. Kucherov, 315–16.
63. Bailes, 22–25 discusses the political attitudes of the engineers.
64. See Antony Sutton, *Western Technology and Soviet Economic Development, 1917 to 1930* (Stanford, 1968), 344–45.

foreign skilled workers wishing, for reasons of political sympathy, to plant permanent colonies in Russia.[65]

The Soviet regime simultaneously expanded the higher educational system it inherited from the Tsar and Provisional Government and rapidly trained new cadres of loyal specialists to replace the bourgeois *spetsy* and foreign concessionnaires after termination of the temporary relationship with each. The government removed restrictions upon social classes for admission to the universities, and it opened fifteen new universities in 1918/9, almost all of which were in Central Asia, Siberia and other areas inhabited by national minority groups. By 1925, the Soviet Union (as its name had become) had 26 universities.[66] The majority of the professors in the universities were those who had taught under the Tsarist and Provisional Government. Now, as "bourgeois intelligentsia," they were training the new proletarian intelligentsia.

In preparation for the industrialization drive and purges of the First Five Year Plan of 1929–1933, the Party Central Committee made radical changes in the higher educational system to produce the new professionals it would need. First, it placed the technical institutes under the control of industry which then decided to narrow the training for the various professions. A particular type of engineer was to be trained to perform only those tasks that fell clearly within his area and would study no peripheral subjects. Second, it divided institutes and universities into their component departments, each of which was then named a separate higher educational institution. As a result of this subdivision, and of some new construction, the number of higher educational institutions rose from 152 in academic year 1929/30 to 537 in 1930/31.[67] To complement training of specialists, the regime authorized the creation of higher educational institutes *within the factory* in 1931. Each was authorized to grant the title of "engineer" to its best graduates.[68]

At the same time, the Soviet government began to purge the foreign and old bourgeois *spetsy* and the teaching staff of the higher educational institutions. "Bourgeois" professors had either to conform to the new arrangement or were dismissed from their positions. Areas formerly worked by foreign concessionnaires were now placed under government bureaucrats for management. The police initiated mass arrests of the most highly skilled and highly educated engineers. Beginning with the trial of 50 mining engineers in the Shakhta Affair of 1928, the terror against the foreign and old Russian specialists grew by 1930 to the point where perhaps more than half of the 10,000 degreed construction engineers were arrested and accused of plotting to overthrow the Soviet government. The show trial of this "Industrial Party" in 1930, fea-

65. A list of foreign concessions is in *ibid.*, Part I; see also Charles Timberlake, "Russian-American Contacts, 1917–1937," *Pacific Northwest Quarterly*, Vol. 61, no. 4 (October, 1970), 217–21; "Autonomous Industrial Colony 'Kuzbas,'" in *Modern Encyclopedia of Russian and Soviet History*, Vol. 2 (Gulf Breeze, Florida, 1976), 174–77.

66. A. E. Ivanov, "Universitety," *Sovetskaia istoricheskaia entsiklopediia*, Vol. 14 (Moscow, 1973), column 821.

67. Sheila Fitzpatrick, *Education and Social Mobility in the Soviet Union, 1921–1934* (Cambridge, 1979), 189–93.

68. Fitzpatrick, 198–205.

tured eight of the country's leading technical experts from the most prestigious of the old technical institutes and some of whom also held important government positions.[69] Stalin was intent on erasing the modicum of Tsarist professionalism which led to professional autonomy during the Provisional Government and the first decade of Bolshevik rule. Although Stalin had to retreat from outright attack upon the technical elite in 1931, he had done the engineering profession and the institutions that trained technologists irreparable damage which adversely affected the Soviet Union's ability to compete against Germany in World War II.

In order to impose social revolution, the Bolsheviks attacked the source of privilege that the professionals enjoyed under the Tsar. They undermined the universities to weaken the remaining opposition therein and fostered the training of new cadres in the special institutes. They favored technical skills over the humanities and liberal arts. The Bolsheviks sought to destroy the vestiges of professional autonomy and loyalty to professional standards and replaced the "bourgeois" professionals with new cadres, loyal to the regime which provided upward social mobility. As the higher educational institutions had been an arm of the state and the professionals the state's servants in the Tsarist period, so the Bolsheviks returned institutions and individuals to that status. But, even during the Soviet period, this triangular relationship did not follow an unbroken line of development.

With political affiliation and class origin more important than professional competence, one can hardly apply to Soviet society the usual analytical devices used by Western sociologists to study "professionalization." University faculties were in chaos, and professional associations were not formed voluntarily by workers. A professional was forced to belong to the appropriate trade union, and purges of the old *spetsy* on charges of sabotage and counterrevolution removed most senior professionals. One of the key differences between Russia and Western Europe in the relationship between state, higher education, and the professions has been and remains the weakness or absence of powerful professional organizations.

69. Kendall Bailes, "The Politics of Technology: Stalin and Technocratic Thinking Among Soviet Engineers," *The American Historical Review*, 79 (1974), 446–47.

Donald W. Light

The Development of Professional Schools in America*

In the second half of the nineteenth century and the first third of the twentieth, the professions in America experienced profound changes in status and character that were intimately bound up with the creation of the modern university, not only because similar forces affected both, but also because each reacted to and used the other in consolidating its identity. Too often observers do not appreciate that professional education is the crucible of a profession—the place where the nature of professional work, its license, and its mandates get defined[1] even when, as seems to be more often the case than not, that definition conflicts with what practitioners actually do. How, then, in this vital period, did professional schools take shape and lay the foundation for the professions as we know them today?

The challenge of this question can only be partially met because scholarship on the subject lacks depth and because our purpose is only to reflect on some of the extant material concerning selected professions. While considerable research has been done on the transformation of higher education in America and the various professions, few scholars have examined the intersection of the two. Those who have considered these relationships underplay the role of social status, power and displaced class conflict in shaping what they regard as the "inevitable" form of professional schools and the modern research university.[2] In order to transcend these limitations, this essay examines in a preliminary way the development of professional schools in the ministerial, the academic, and the medical professions.

The social history of professional education needs concepts and theories which will advance one beyond the particulars of institutional history and which will avoid the trap of treating all professions as if they were like medicine. One such concept is *structural ambiguity*. Developed originally by Eleanor Barber and Robert K. Merton,

* I am indebted to Roma Heaney for her research assistance on this essay. Konrad Jarausch, Barbara Wheeler, Gibson Winter and James McLachlan made valuable suggestions.

1. Everett C. Hughes, "Professions," 374–386 in Everett C. Hughes, *The Sociological Eye* (Chicago, 1971).
2. Talcott, Parsons and Gerald Platt, *The American University* (Cambridge, Mass., 1973). C. Jencks and David Riesman, *The Academic Revolution* (New York, 1968).

who used the less precise term, sociological ambivalence,[3] this notion refers to the cross-cutting pressures and expectations experienced in a role or by an institution when it finds itself located at the intersection of two social structrues for which it has different meanings.

The history of professional schools, at least in the United States, is the history of structural ambiguity arising from the schools being part of (or akin to) the university as well as the training center for a practicing profession. Responding to and assuming the attributes of a university by valuing research, hiring and training specialists, publishing journal articles that are taken to represent professional reality, and creating an academic profession have put professional schools in constant tension with the bulk of the profession which expects them to train competent practitioners. This leads to another, related ambiguity about the mission of the schools: to what extent are they to *train* practitioners and to what extent are they to *educate* pure disciples of the profession's core knowledge? The most important outcome of this tension has been to create a hybrid, to train disciples of the profession's knowledge base, who too often tend to be neither well prepared with the skills for being effective practitioners nor able to bring a critically honed intellect to bear on questions of law, medicine or theology.

The development of professional schools has also involved the process of *status transfer* by which an elite faction used the universalistic rhetoric of science and the modern university to legitimate its own particularistic approach to professional work by institutionalizing it in such a way as to preserve its privileged class position. The modern university itself is an example of this process, and it is here that the interest of university entrepreneurs in the last quarter of the nineteenth century, who acted as agents for the new industrial barons, coincided with the interests of professional elites. Even when they did not gain control of state licensing, they significantly reduced the size and stature of their competition. Status preservation and its transfer to a professional guise helps to explain the desire to create a circle of associates who share the common culture of educated men and who uphold an intellectual tradition. Although these themes are only implicit in most accounts, they cut across the several professions beginning with the most prestigious of the nineteenth century, the ministry.

Training Ministers in the Seminary:

Most accounts of the professions do not include the ministry; for scholars find it easiest to leave its difficulties behind. It was a profession in decline, and were one to account for that one would have to revise most of the theories of the professions, which rely so heavily on the medical profession and the themes of monopoly and dominance that they cannot explain decline. Moreover, training ministers presents the greatest challenge to the study of professional schools because the graduate seminary arose before the modern university, and to a significant degree seminaries did not become affiliated with colleges and universities. There has been a long history of mu-

3. Robert K. Merton and Elinor Barber, "Sociological Ambivalence," in Robert K. Merton, *Sociological Ambivalence in Other Essays* (New York, 1976).

tual suspicion which still manifests itself today. Seminary staff suspected university faculty of being faithless if not hostile. The latter, on the other hand, wondered how serious intellectual work could be done if one were upholding a particular religious world-view. As if these anomalies were not enough, the student of the professions faces a dearth of scholarship on ministerial education except for the Auburn Historical Project which examines the roots and dilemmas of the seminary as an institution of professional education.[4]

One cannot understand the origins of the seminary and its relation to early colleges without appreciating the fact that most of the early colleges functioned as *de facto* seminaries and were expected to produce an educated class of ministerial leaders. On the eve of the Revolution the colonies could boast of nine colleges—Harvard, William & Mary, Yale, New Jersey, Kings, Rhode Island, Queens, Philadelphia and Dartmouth. Modelled on the English universities of Oxford and Cambridge, all these institutions were intended for the upper class expatriate Englishman seeking to create order in the New World. The guiding principle in the new colleges was the need to nurture orderly, scholarly and moral values in aristocratic gentlemen who would one day become the leaders of the new nation. Their training accordingly stressed traditional subjects, such as classics, law and philosophy, and emphasized the importance of religion. Therefore, each college reflected the religious commitment of its founding fathers. Yale and Princeton, for example, represented the efforts of men striving for the "pursuit of denominational survival in an environment of religious diversity"—Puritan and Presbyterian respectively.[5]

In this context of post-revolutionary secularization, church fathers feared that the solemn duty of educating ministerial leaders could no longer be entrusted to the colleges. In 1808 Archibald Alexander complained that, "Our *seminaries of learning*, although increasing in literature and numbers, furnish us with few preachers." In fact, these feelings had been developing in institutional shifts that foreshadowed the creation of the seminary as a solution to the profession's problems. The Great Awakening of the 1740s had been viewed with skepticism by Harvard and Yale so that increasingly "awakened" young men graduating from college studied for part or all of a year with one of the more prominent revival preachers. "The pro-awakening forces were no longer content to rely only upon the established colleges as the primary focus of theological education."[6] With the rapid expansion of settled territory after the Revolution and the unmet need to produce more ministers, many parishes set up rather rigorous courses of study and examination for the flegling ministers who apprenticed under their senior minister.

The specific circumstances surrounding the founding of the first seminary involved the election of Henry Ware, a well-known Unitarian, to be the Hollis Professor of Divinity at Harvard in 1805 and the election of another well-known Unitarian, Samuel Webber, to be its president in 1806. The evangelical Congregationalists, whose own candidate, Eliphalet Pearson, had been acting president of Harvard in the preceding two years, found in this defeat a sign of heresy. No longer could Harvard be trusted

4. The Auburn History Project, *Why The Seminary?* (typescript, October 19, 1978).
5. Frederick Rudoph, *The American College and the University: A History* (New York, 1962).
6. The Auburn History Project, 8–15.

to educate properly evangelical leaders, and Pearson resigned from the Harvard faculty to establish with others a new kind of school in the village of Andover. Named Andover Theological Seminary, it upstaged Harvard by providing a broad post-baccalaureate education in Christian Theology, Sacred Literature and Sacred Rhetoric. "Not only would the school be a graduate institution," the Auburn Project concludes, "it would also have a faculty of more than one. No such graduate institution yet existed in the United States."[7]

Besides having three professors of sacred studies, the seminary at Andover required for admission "a college education or its equivalent [and] evidence of piety as in a conversion, moral character and membership in a congregation."[8] Moreover, it mounted a three-year program of post-baccalaureate study and charged tuition. Yet nineteen students were waiting for admission the year it opened. By 1836, Andover had received 693 students with only 42 lacking a college degree. No other professional school would come close to these standards of admissions and rigor for almost a century. Moreover, Andover became the model for many of the seminaries established in subsequent years so that its standards were widely emulated (e.g., in Princeton Theological Seminary), though practical necessity often required compromises.

From this brief sketch several conclusions can be drawn. First, the Auburn Project misleads when it concludes that "the seminary arrived on the scene suddenly and without warning."[9] It is true that the particular design of the seminary emerged full-blown from the planning sessions at Andover, but this was more like a flower stemming from deep and old sociological roots.

Second, Andover Theological Seminary (and others like it that were to follow) manifested all the signs of elite institutions. Andover was founded by members of the New England aristocracy to preserve their values and institutionalize their dominance in the ministerial profession. Having been rebuffed at Harvard, Pearson made the seminary more elite than Harvard by requiring a college degree for admission and by having three rather than one professor of divinity. Moreover, the six chief donors of the Seminary gave it all the buildings and houses in town for the faculty as well as an endowment twice as large as the one which Harvard had been building up for nearly two hundred years. As for the students it attracted, "the full seminary course was expensive in money and, even more important to a restless nation on the move, represented a substantial commitment of time."[10] Thus the nation's first professional school chose to educate an elite group by requiring three rare resources—a college degree, discretionary funds, and leisure time.

Third, the elite of the most prestigious profession joined hands with their wealthy patrons to control professional education far beyond their local institution. In a pattern which foreshadows the hegemony of scientific medical schools a century later, Pearson and his colleagues at Andover established in 1815 the American Education Society which provided scholarships to students who would "pursue a regular three-year course of theological study" at institutions which conformed to the Andover model. Many seminaries that did not fall into line soon closed; those that did re-

7. *Ibid.*, 12-13.
8. *Ibid.*, 13.
9. *Ibid.*, 7.
10. *Ibid.*, 7-8.

ceived a steady and generous financial foundation. The Society's power is measured by the fact that it sponsored about one-quarter of all seminary students during the formative years 1815–1860 at approved seminaries.[11]

Fourth, the majority of ministers and preachers attended neither college nor seminary during this early period or later. In fact, as the century progressed, a decreasing percentage of ministers had a college degree because of their greatly expanded number and rude circumstances in the Westward territories. They learned by apprenticing and by doing, but one should not assume that they were illiterate. Many of these self-taught preachers wrote eloquent sermons and essays. In this context, seminaries provided a formal training to the elite of the profession.

Finally the relation between the early colleges and the seminaries was complex and symbiotic. On one hand, seminaries were backed by and part of a church, a basic reason why they could survive as freestanding institutions, though hundreds of them closed as well. More specifically, they were missionaries of a denomination, a symbol of the church and its future, an organization designed to proselytize a given denomination's world view. Theirs was the terribly important task of training preachers fast enough to keep up with the rapidly expanding population and increasingly materialistic society. On the other hand, seminaries incorporated the attributes of a college—courses, professors, scholarly journals, texts, and an emphasis on academic study. Ideally, such attributes should enhance, not dampen, religious fervor; and the first seminaries such as Andover and Princeton embodied both evangelical religious passion and serious academic study.

However, this tenuous symbiosis tended to break down. As early as 1820 no less a person than Beecher wrote back to Andover,

> I must say I have been troubled at the complaints which have been made at the want of animation of the Andover students .... Your preachers must wake up, and lift up their voice. They must get their mouth open, and their lungs in vehement action.[12]

Beecher unwittingly identified the anti-professional character of preaching that would paradoxically lead at the turn of the century to the decline of the ministry as a profession at the same time that seminaries incorporated the model of the modern, research university.

Although theological seminaries anticipated professional training, they only became professional schools in the full sense after the development of the large, diverse, specialized university. Most seminaries, and particularly the leading ones, responded to the model of the research university even if they did not belong to one. Most notable was the transformation of the Congregational seminary at Hartford from a relatively minor institution to a center which eclipsed Andover Theological Seminary. The turning point occurred when the seminary appointed David Hartranft to its faculty. He advocated hiring a young, scholarly faculty, each with his own specialty and an investigator in his own right. He quickly assumed the role of developing the faculty and introduced the elective system in 1891. He even started a Department of Sociology at the seminary. By 1910, the essential areas of study for mission work were identified as The Science and History of Missions, The Religions of the World,

11. *Ibid.*, 21A–B.
12. *Ibid.*, 23.

Sociology, Pedagogy and the Science of Language. Soon thereafter, the seminary at Hartford laid plans to become a "theological university." A mixture of Scottish pragmatism and German scholarship emerged as reflected in George F. Moore's description in 1908:

> The ministry is a *practical* calling like law and medicine .... Just as it is not the primary end of the law school to produce men learned in the history and philosophy of jurisprudence, but to train men to *practice* law ... so it is not the primary end of the theological school to send out men learned in the history and philosophy of religion, but to train men for the practice of the ministry.[13]

This movement towards making the seminary a sophisticated professional school modelled after the modern university, with its mixture of pragmatism and specialized research, grew through the first third of the twentieth century. With it the common culture and curriculum of seminaries began to break down. Moreover, they began to look more like academic departments of religious or theological studies that had been established in universities and which granted a Ph.D. rather than a D.D. In 1893, a spokesman for Hartford said: "The theological seminary is not a church and was not intended for the spiritual training of future Ministers, but for their intellectual training." This view was further strengthened by the famous Kelly report of 1924 which contained a detailed survey of nearly all theological schools.[14]

There is good evidence to argue that *as the seminary became more professional it became less religious.* Although seminaries could and did build a world of their own and eventually developed national standards as well as other signs of professionalism, the Auburn study indicates again and again that those who emphasized spiritual belief, who retained fundamental touch with the primal religious experience, set up their own schools and attracted a wide following.

One manifestation of this trend was the establishment of religious training schools to provide an Army of the Lord large enough to serve the masses of immigrants spreading across the land. There were not enough ministers or seminaries to do the job; so evangelists such as Dwight L. Moody and A. T. Pierson called for "missionary training schools" to quickly prepare "gap-men" to meet the demand. Brevity and practicality guided the curriculum, and during the thirty years 1881–1921, several score of these schools opended their doors. They concentrated on Bible study and techniques of evangelical work, allowing students to drop in and out and providing the kind of low-budget, flexible institution that many of the denominations needed. As accreditation of colleges became more organized, and other structural changes altered the educational landscape, these schools either closed, merged, upgraded themselves, or became Bible schools.[15] In whatever form they took, these low-level schools turned out God-fearing evangelists who could preach as well as—or sometimes better than—seminary graduates.

The success of gap-men and self-taught preachers against a powerful and elite group of professional ministers indicates the failure of most theories of the professions to appreciate the influence of client choices and economic factors in affecting

13. Auburn Historical Project, Ch. 4.
14. *Ibid.*, 84–87.
15. *Ibid.*, 72–75.

professional development.[16] Seminary graduates had a greater command of their esoteric body of professional knowledge, but could not demonstrate that it made a significant difference in their ability to meet the spiritual needs of parishioners. In fact, as Beecher noted years before, it may have impeded that ability. Moreover, this inter-professional competition undermined religious authority by manifesting doctrinal relativity. This problem was abetted by the tendency to proselytize—to pursue potential clients.

In addition, other academic disciplines within the new university developed an expertise about Biblical scholarship, ancient languages, organizational behavior and even sociology that matched if not exceeded the expertise of seminarians. Thus graduates of seminaries had control over neither the services to clients in the field nor an expert body of knowledge in the academy. Religious training became a class phenomenon, with graduate seminaries training educated sons of "good" families to be ministers to the affluent or to be faculty at other seminaries, undergraduate seminaries training less educated sons to minister unto the middle classes, and missionary or Bible schools quickly turning out preachers for the farmers and workers throughout the newly settled territories. To some extent, this stratification ran along denominational lines.

Ironically, the very evangelical purity that inspired Pearson and his friends to found the first graduate seminary was driven from the seminary as it became more professional. The Auburn study implies a fundamental conflict between the university model of training critical minds and the religious model of preaching one's convictions in order to convert others. The most interesting question is whether the ministry can be a profession except under circumstances of religious homogeneity which allow monopoly and suppression of competitors. For the history of the seminary from its foundings at Andover in 1806 to the Brown-May report in 1934 is the history of an elite losing touch with the core of religious experience as it acquired the attributes of a modern profession.

Emergence of the Academic Profession:

Since professional schools and the modern university grew up together in America, their confluence cannot be fully understood without considering the latter. For professors of pastoral counselling or pulmonary medicine are members of their respective professions and the academic profession as well.

In the eighteenth and through most of the nineteenth century there was no academic profession as we understand it today. The traditional colleges concentrated on mental discipline and piety. In the 1870s, President McCosh of Princeton affirmed: "Religion should burn in the hearts, and shine ... from the faces of the teachers...." One was to avoid education "which puts a keen edge on the intellect while it blunts the moral sensibilities...." This meant that through recitation of the classics and pages of disciplinary rules, colleges attempted to control the mental and moral lives of their students. They believed that restraint produces self-restraint, hard work produces diligence, and precise memorization and recitation produce a disciplined mind

16. William Rothstein effectively makes this critique in the first chapter of his book, *American Physicians in the 19th Century: From Sects to Science* (Baltimore, 1972).

in any field of endeavor. Such goals provided no support for an academic profession. Faculty spent their time being disciplinarians and hearing memorized recitations of ancient languages or mathematics. There was no academic career, salaries were low, and as President Eliot remarked in 1869, few men of talent were attracted to the academic calling.[17]

For both higher education and the academic professions, the decades following the Civil War witnessed major changes. Rapid population growth, urbanization, mass immigration and industrialization transformed the social context of higher education. Men from all walks of life were making fortunes, and few considered college as relevant to the business of living or the life of business. Most new colleges soon closed, and enrollments fell behind at others. For example, attendance in the 1870s at twenty of the oldest leading colleges rose 3.5 percent while the nation's population grew by 23 percent. The proportion of ministers, lawyers, and Congressmen with a college degree declined. Charles Kendall Adams of Michigan declared: "In all parts of the country, the sad fact stares us in the face that the training which has long been considered essential to finished scholarship has been losing ground from year to year." Representing his industrial and business peers, Andrew Carnegie wrote in 1889:

> While the college student has been learning a little about the barbarous and petty squabbles of a far distant past, or trying to master languages which are dead, such knowledge, as seemed adapted for life upon another planet than this, as far as business affairs are concerned, the future captain of industry is hotly engaged in a school of experience, obtaining the very knowledge required for his future triumphs .... College education as it exists is fatal to success in that domain.[18]

While this crisis was developing, the foundations for its solution were being laid. Most important was the new German model of the university which replaced the preservation and transfer of classical learning with the pursuit of new knowledge through investigation and specialization.[19] As early as the 1840s, a few scientists like Joseph Henry began to identify themselves as "men of science" and to create a community of professional scientists called the Lazzaroni. "We are overrun in this country with charlatanism," Henry said. "Our newspapers are filled with puffs of Quackery and every man who can burn phosphorous in oxygen and exhibit experiments to a class of young ladies is called a man of science."[20] Another early scientist, William Barton Rogers, founded in 1840 the Association of American Geologists, which soon evolved into the American Association for the Advancement of Science. The goal was to create a "community of the competent" which would maintain high standards and judge each others' work. The Standing Committee of the AAAS rejected papers they deemed unworthy, but still its membership was too large and so the inner circle

17. Lawrence Veysey, *The Emergence of the American University* (Chicago, 1965), 6-40.
18. Veysey, *Emergence*, 4-14.
19. Steven Turner "The Growth of Professional Research in Prussia 1818-1848—Causes and Contexts," *Historical Studies in the Physical Sciences*, 3 (1971), 137-182.
20. Thomas L. Haskell, "Professionalization as Cultural Reform," *Humanities in Society*, 1 (1978), 105-111.

of the Lazzaroni founded the National Academy of Science in 1863. Rogers became the founding president of M.I.T., and another member, Benjamin Pierce, drew up plans for the Lawrence Scientific School at Harvard. Others were instrumental in establishing research science at other institutions.

According to the historian Thomas L. Haskell the closest thing to a headquarters for this movement was the American Social Science Association, founded in 1865 in Boston. Members chose Rogers to be their first president, and most of the key reformers such as Charles Eliot, Daniel Coit Gilman and Andrew D. White were active members. Because of its concept of the social sciences, the ASSA became the center of professionalizing both within the university and without. It had four departments: jurisprudence for lawyers, education for professors, health for physicians, and "economics, trade and finance for businessmen." Thus its members played important roles in the civil service reform movement, the founding of the American Public Health Association and the National Conference of Social Work as well as the establishment of many professional associations for academic disciplines.[21]

Instead of a widespread crisis of authority, the rise of professionalism responded to a crisis among a small, Eastern elite. Haskell himself states that "the ASSA was the creation of gentlemen scholars, reformers, professional men and others of the New England gentry class." He continues:

> The Victorian gentlemen who gathered annually in Saratoga Springs for ASSA meetings clearly felt that they were embarked on a crusade to elevate American culture and defend civilization itself; they felt this even as they undertook such pedestrian tasks as trying to standardize bar admission requirements nationwide, or petitioning the Massachusetts legislature for a law replacing coroners with trained physicians, or working for the creation of a board of medical examiners to crush "quackery."[22]

Hundreds of these more intellectual gentlemen had traveled to Germany and discovered a new form of education that spoke to the needs of an industrial society and would enable them to transfer their ascribed status into an achieved one.

The first institutional manifestation of the scientific university occurred in carefully contained schools of science at older colleges such as Harvard an Yale.[23] But the movement towards the research-oriented university gained immeasurably with the founding of Johns Hopkins University in 1876. Designed to be primarily a graduate research institution, Johns Hopkins set off a fierce competition among both the older universities and the new ones established by the great fortunes of the industrial boom. Just as the German research university was greatly aided by princely competition, so the great industrial fortunes behind Hopkins, Chicago, Stanford and Clark hired entrepreneurial presidents to vie with each other for the best research faculty. This emphasis led to ever-increasing specialization, the establishment of departments, journals, professional associations, graduate training and in general the attributes of an academic profession. In its strictest form, academic research looked down on "professional work." Research was a way of life, a subordination of self

21. *Ibid.*, 112.
22. *Ibid.*, 110.
23. Light, "Introduction: The Structure of the Academic Professions," *Sociology of Education*, 47 (1974), 2-28.

and dedication to pure intellect and to facts. Yet on the whole, the German research model in the United States combined with pragmatism. More often its advocates argued that through scientific education and inquiry, rather than through mental and moral discipline, higher education would make original and direct contributions to the growing industrial society. "Slowly at first, but then with increasing speed, education began to be identified with material success, bringing it into the notice of those whose financial backing was necessary for its widespread growth." Shortly after his cutting remarks against higher education, Andrew Carnegie donated a hundred thousand dollars to Clark University, the purest of the research universities.[24]

This selective account highlights the development of the research university to illustrate the relationships between status, security and science in the effort by the old upper classes to secure a new basis for its privilege, in the name of truth and equality. As with the American Education Society, the academic elite and great corporate wealth worked to impose their view on those institutions not immediately within their control. In 1900, the Association of American Universities was founded to promote research as the "intrinsic function of the American university"[25] and admitted only thirteen institutions on the basis of their graduate schools. Soon thereafter, Andrew Carnegie established the Carnegie Foundation for the Advancement of Teaching to provide pensions for professors at institutions that fit the elite Oxbridge or German models and thus filled a vital need in the formation of academic careers. However, when state universities applied to be admitted to the pension system in its second year, the Foundation's president, Henry Prichett, turned them down for lacking sufficient academic standards.[26] Pressures such as these and the new criteria of excellence which the promoters of research universities had established led the state universities to agree that research should be a major concern of their institutions.

The other great voice promoting the research university was Abraham Flexner, the head of several of the Carnegie-sponsored investigations of higher education whose recommendations were taken as guide for philanthropy by other industrial tycoons. Flexner spoke out against utilitarianism even to a degree that did not recognize its actual merger with research. "A university should not be a weather vane, responsive to every variation of popular whim. Universities must at times give society, not what society wants, but what it needs." The concern of the ideal university should be with four areas—the conservation of knowledge and ideas, the interpretation of knowledge and ideas, the search for truth, and the training of students who will practice and carry on such ideals. Flexner argued for the pursuit of science and scholarship within the university and questioned the appropriateness of vocational or popular education within the university. "A clear case can, I think, be made out for law and medicine, not for denominational religion, which involves a bias, hardly perhaps for education, certainly not at all for business, journalism, domestic 'science,' or library 'science' ...." By professions, Flexner meant, "learned professions—learned because they have their roots in cultural and idealistic soil" and

24. Veysey, *Emergence*, 3, 142-144, 266-267.
25. *Ibid.*, 130.
26. *Bulletin of the Carnegie Foundation for the Advancement of Teaching* (No. 1) 1907, 1-7.

derive their essential character from intelligence. Of course, the surgeon uses his hands; the physician uses a stethoscope; the lawyer uses a clerk and an accountant. But these are the accidents of activity. The essence of the two professions resides in the application of free, resourceful, unhampered intelligence to the comprehension of problems—the problems of disease, the problems of social life, bequeathed to us by history and complicated by evolution. Unless legal and medical faculties live in the atmosphere of ideals and research, they are simply not university faculties at all.

Undergraduate education could safely be left to its own devices. Articulating the Eastern bias of the research university model, Flexner believed that hundreds of colleges and universities "more especially in the South and West—though the East is not free—are hotbeds of reaction in politics, industry and religion, ambitious in pretension, meagre in performance, doubtful contributors, when they are not actual obstacles, to the culture of the nation."[27]

The rise of the research university and the academic profession was not inevitable or a natural evolution towards a predestined form, but an institutional form aggressively promoted by the old elite and new wealth to serve their purposes. In fact, its dominance has never been nearly so prevalent as scholars like Veysey, Jencks and Riesman, and Parsons and Platt would have us believe. American higher education has been influenced by three models: the Oxbridge idea of mental discipline and liberal arts for the gentile class; the Scottish model of useful knowledge imparted to anyone who wants to learn; and the German model of pure research in order to seek the deepest truth.[28] These conceptions imply different subjects, organized in different ways, taught to different kinds of students. Numerically, the research university model was adopted by a minority of elite institutions and imitated to some degree by many others. However, at those institutions and even at the elite universities, it was combined with a heavy emphasis on utilitarian practices and liberal arts undergraduate teaching.

At the time, diversity took the form of land-grant colleges, normal schools, and Bible schools.[29] Despite the numerical and sociological significance of these diverse institutions and their non-Germanic character, the creation of the research university provided the most powerful paradigm for what twentieth century higher education should look like. Besides shaping the leading institutions, it influenced the organization of academic careers in other institutions and constructed the only coherent account of academic reality so that the many who do not embody it still measure themselves against it.

The academic profession created by this social movement is surrounded by myths. It is important not only as one of the professions in its own right but also as the profession to which a practicing profession became allied when it established professional schools with professors, departments, journals, tenure ladders, and the like. Yet such faculty are a special case because of the distinct utilitarian cast of professional schools. Universities found professional schools attractive because they con-

27. Flexner, *The University: America, England and Germany* (Oxford, 1930), 5-45.
28. A. Engel, "The Rise of the Academic Profession in 19th Century Oxford," in Lawrence Stone, ed. *The University in Society* (Princeton, 1973); and G. E. Davie, *The Democratic Intellect: Scotland and Her Universities in the 19th Century* (Edinburgh, 1961).
29. E. Alden Dunham, *Colleges of the Forgotten Americans* (New York, 1965).

tributed to the larger effort to make higher education more useful and therefore attractive to potential students. Professions—or the elite factions promoting rigorous professional schools—liked universities because their emphasis on science and research gave universalistic legitimation and respectability to their particular interests. At the same time, this marriage of convenience defined the structural ambiguity experienced by professional schools both in their relations with the university and with practicing members of their profession.

Turmoil and Resolution in Medical Education:

American medicine began the nineteenth century without many of the advantages of the ministry. It did not have the magisterial authority of a Bible on which to found its practice but instead worked with crude, often false notions about the body and its diseases. Herbal and botanical cures, largely practiced in the home or by folk healers, made up most "medicine" and were more effective than the heroic cures of physicians such as bloodletting and calomel (mercury), if only because they killed the patient less often.[30] The early medical profession also lacked the prestige of the ministry and the presence of venerable, wealthy institutions like churches to sponsor new initiatives and sustain them through difficult times. Most physicians worked part time on their own, and new physicians learned through the self-perpetuating, decentralized system of apprenticing for three years and paying $100 annually for the privilege. Yet by the beginning of the twentieth century, medicine and particularly its schools had become the model which the ministry and every other profession wished to emulate.

Attempts to explain this transformation have tended to fall into two groups. One begins with modern medicine and emphasizes the possession of an esoteric body of valued knowledge as the basis for a social contract which grants the profession autonomy and certain privileges in return for selfless service and self-regulation.[31] This account hardly helps to explain breeches of the contract, and it has little to say about professional activity in the pre-modern period. It does, however, provide a core argument for why preaching and pre-modern medicine had so much trouble coalescing into a unified profession. By contrast, the other group of theories considers the knowledge base secondary to the use of power, status and politics by an occupational group to corner a market, use state powers to exclude competitors, and gain control of social institutions.[32] This perspective is more useful in explaining what happened in the ministry or medicine during the nineteenth century, yet it fails to clarify why such maneuvers were not wholly effective and were successfully challenged by competing sects.

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30. Rothstein, *American Physicians,* Chapter 2.
31. Talcott Parsons, "The Professions and Social Structure," in *Essays in Sociological Theory,* 34-39 (Glencoe, 1954). William J. Goode, "Community Within a Community: The Professions," *American Sociological Review,* 22 (1957), 194-200. Bernard Barber, "Some Problems in the Sociology of Professions," *Daedalus,* 92 (1963), 669-688.
32. Eliot Freidson, *Profession of Medicine* (New York, 1970). Terence J. Johnson, *Professions and Power* (London, 1972). Magali Sarfatti Larson, *The Rise of Professionalism: A Sociological Analysis* (Berkeley, 1977).

Apprenticeship prevailed until the rapid expansion of population and territory after the Revolution called for training in larger numbers. In larger towns and cities, several physicians banded together to form private medical schools where they offered two four-month terms of lectures for two years after which students apprenticed with a preceptor for another two years. This nascent form of professional education was highly profitable and superior in quality to the full apprenticeship system that had existed before. Throughout the nineteenth and early twentieth century it grew rapidly. The four schools all located in the Northeast in 1800 grew to 44 schools of regular medicine in 1850, only 17 of which were in the Northeast, and they graduated about 1,720 students a year (Table 1). In addition, three homeopathic and four eclectic schools had been founded. Regular schools peaked in 1906 at 130 institutions graduating about 5,000 students annually, while homeopathic and eclectic schools had already begun to shrink to a graduating class of 472 a year.[33]

The curriculum through much of the nineteenth century included physics, *in*organic chemistry, anatomy (by lecture only), physiology, etiology and diagnosis of disease, and medical theory. Moral values of the time prohibited students from doing actual dissection and from observing obstetrics. Of particular note was the preoccupation with theory-building in the absence of solid information, a pattern found among religious sects as well. Practically speaking, "these speculative and unempirical systems were a serious detriment to medical education in turning the student's attention away from empirical observation toward rationalistic nosologies."[34]

Medical schools expanded in number and size because they were highly profitable. Since all the instruction was by lecture, equipment and overhead were minimal, and profits rose with enrollment. At a time when physicians averaged $1,000 a year income, and $2,000 was considered large, professors at the College of Physicians and Surgeons (Columbia) earned another $2,000, and faculty at the University of Maryland an additional $4,000 in student fees. Lecturing also enhanced their private practices. By mid-century, medical schools were competing openly for students, offering free lectures in the area to spread the word and touring the new students around the countryside before each semester. Preceptors, who formed a network of potential recruiters, were made fellows of the school and even granted honorary degrees. Active recruiting was needed, because medicine was not a popular career among the educated. Only 6 percent of the 1854–1864 graduates from the New York Free Academy chose medicine, while 20 percent chose to be lawyers and another 20 percent chose to enter teaching. An analysis of graduates from the major Eastern colleges from about 1800 to 1850 yielded similar figures.[35]

A more serious consequence of this competition was that standards declined. Terms shortened, Latin was dropped, final exams became oral and "not unduly severe," and most schools certified apprenticeship without specifying how much time had been spent in it.[36] This competition, which intensified as the century progressed, was the principal reason why efforts to upgrade or reform medical education failed.

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33. Rothstein, *American Physicians,* Chapter 5.
34. *Ibid.,* 81. Cf. D. Light, Jr., "Uncertainty and Control in Professional Training," *Journal of Health and Social Behavior,* 20 (1979), 310–322.
35. Rothstein, *American Physicians,* 95, 120.
36. *Ibid.,* 97.

Table 1: Medical Schools, Students, and Graduates by Sect 1850–1920

	Regular			Homeopathic			Eclectic			Other			Total		
Year	Schools	Students	Graduates	Schools	Students	Graduates	Schools	Students	Graduates	Schools	Students	Graduates	Schools	Students	Graduates
1850	44	–	–	3	–	–	4	–	–	1	–	–	52	–	–
1860	53	–	–	6	–	–	4	–	–	2	–	–	65	–	–
1870	60	–	–	8	–	–	5	–	–	2	–	–	75	–	–
1880	76	9776	2673	14	1220	380	8	830	188	2	–	–	100	11826	3241
1890	106	13521	3853	16	1164	380	9	719	221	2	–	–	133	15404	4454
1900	126	22710	4715	22	1909	413	9	522	86	3	–	–	160	25171	5214
1903	126	24930	5088	20	1498	420	9	848	149	5	239	41	160	27615	5698
1906	130	23116	4841	19	1085	286	8	644	186	5	359	51	162	25204	5364
1910	109	20136	4113	12	867	183	8	455	114	2	68	30	131	21526	4440
1913	92	15919	3679	10	850	209	5	256	93	0	0	0	107	17015	3981
1916	82	13121	3274	10	638	166	3	263	78	0	0	0	95	14012	3518
1920	76	13220	2826	5	386	97	1	93	30	3	389	94	85	14088	3047

Source: Rothstein, William C. American Physicians in the 19th Century (Baltimore, 1972).

Moreover, it put medical schools in direct conflict with practicing physicians on two counts. First, more students meant more fees for medical faculty but more competitors for practitioners. And second, the greater the proportion of one's medical education taken in the schools, the less practicing physicians benefited from the fees and cheap labor of apprentices. Physicians in medical societies responded by trying to control licensing through the societies, but the schools succeeded in getting the M.D. degree recognized as the equivalent to passing the licensing examination.

Despite their low standards and the inferior quality of their recruits, these schools constituted a distinct improvement over the apprenticeship system because medical school faculty generally knew more and taught better than most practitioners. In addition, the curriculum became more uniform so one could begin to have some idea what medical students were learning.

In an atmosphere of enmity and endless factional wars, the wealthy and best educated physicians banded together to form exclusionary societies. Their members also formed the nuclei of state medical societies, which in turn pressed state legislatures to pass licensing laws and have the licenses issued by the societies. This pattern shows that the purpose of the laws was not regulatory but honorific. As medical schools began to form, they realized that just as a letter of commendation from a tutor was not so effective as a license in giving a physician an official stamp of legitimacy, so independent school diplomas were not nearly so prestigious as a degree from a state chartered institution. Thus most schools applied for a charter, and if it was refused, they found some liberal arts college to use its charter for granting degrees:

> Liberal arts colleges were often receptive to these overtures because the medical schools made no financial demands on them and gave them added prestige. Regardless of whether the medical school was independent or legally affiliated with a liberal arts college, all medical schools of the period were proprietary in that they were financially autonomous. This greatly restricted the influence of the liberal arts colleges over the actions of the medical schools.

Hence early medical education was attached to educational institutions yet remained relatively autonomous.[37]

While efforts were being made to standardize and enhance the image of medical education, a medical elite not unlike the ministerial elite took shape and tried in various ways to mold medicine in its image. From colonial times the sons of affluent or prominent families on the East coast went to Europe—principally Edinburgh—for further study.[38] While it became commonplace among the socially prominant physicians, it certainly did not among most physicians. With common social and professional bonds, these graduates banded together and tried in various ways to restrict the practice of medicine to those who were licensed *and* had a doctor's degree.

The failure of the proto-professional ideas of John Morgan (1765) demonstrates that "an elite based solely on social distinction could not succeed in this country. The next best thing was an intellectual medical elite based on the universities."[39] In the decades that followed, this status transfer took place as the medical elite clustered

37. *Ibid.*, Chapters 4, 5 and p. 88.
38. Rosemary Stevens, *American Medicine and the Public Interest* (New Haven, 1971), 16.
39. *Ibid.*, 17.

around Harvard, Pennsylvania, Columbia and a few other schools. To appreciate the social dynamics of this process, one must remember that the best educated, Edinburgh-trained physicians could not be medically more effective than the semi-literate botanical practitioners. In fact, given their bold, confident practice of prescribing mercury and draining large quantitites of blood, they were often more dangerous.

Leading physicians tried to upgrade medical education by forming the American Medical Association in 1847. Studies had shown that no more than 20 percent of medical students at the best Eastern schools had a college degree, and elsewhere (even at Penn and Bellevue Hospital) the figure was closer to one percent.[40] Newly formed medical schools were diluting their course of study, and so the AMA convention of 1847 proposed higher entrance requirements, a longer course of study, close supervision of apprenticeship experience, and a list of specific courses. None of these would actually improve medical services for reasons already stated, and the proposals failed because no school wanted to follow them.

During the second half of the nineteenth century, stratification within the medical profession further increased. The best educated and wealthiest physicians settled in the major cities and formed elite societies. As the early medical associations had merged into state societies and become open to everyone, elite physicians dropped out and formed their own groups. "The nominal basis of these elite societies was scientific." They held and controlled faculty positions at nearby medical schools, attending positions at major hospitals and consultations. The editor of *Medical Record* wrote in 1877: "There are always several so-called professional rings which exist in larger towns and cities. The principal ones are those which revolve around a particular college, and are almost absolute in their exclusiveness." Criteria for belonging included family income, status and ethnicity. "No immigrants were members of the New York Medical and Surgical Society, even though some of the city's leading medical scholars were immigrants. Ostentatious display also became common. Wealthy San Francisco physicians, for example, often owned foreign-made gold-plated instruments...."[41]

These physicians began to specialize. The work was easier, more prestigious, and the hours more under their control. Writing in 1875, John Billings found a close relation between the best-educated, most specialized, and most influential physicians and social background. As medically valid knowledge grew in the second half of the nineteenth century, more of this elite travelled to Germany for specialized training and returned to form specialty societies and hospitals. Between 1864 and 1902, fifteen specialty societies were formed. General practioners felt economically and professionally threatened by this growing cadre and tried unsuccessfully to deny specialists representation in the AMA.[42]

The emergence of medical professional schools was further complicated by factional wars and the development of competing sects. Many individuals avoided regular physicians at all costs, and many physicians as well were disturbed by what their heroic techniques did to their patients. The outcry against regular medicine grew as its ranks increased, and it found expression in the Thomsonian Movement. Samuel

40. Rothstein, *American Physicians,* 113.
41. *Ibid.,* 202-205.
42. *Ibid.,* 205-213.

Thomson (1769–1843) organized current knowledge of botanical medicine into a useful and charming book, containing frightening stories of patients made worse by regular physicians, with "their instruments of death, Mercury, Opium, Ratsband (arsenic), Nitre and the Lancet." Thomson established Friendly Bontanical Societies which grew so rapidly that by 1833 he employed 167 agents to organize them. Regular physicians tried to use licensing laws to discredit Thomsonian practitioners. They and the lay members of their societies responded by initiating a drive to repeal the laws. To a large extent this drive succeeded. It should be understood not only as part of Jacksonian populism but also as a grassroots attack on the therapies and postures of regular physicians, extolling the ability of people to take their illnesses into their own hands.[43]

A second important sect was homeopathy, started in Germany by Samuel Hahnemann (1755–1843) near the turn of the century.[44] Homeopathy focused on very diluted dosages of chemicals which produced symptoms like those of the disease. From the perspective of regular medicine, this was no treatment at all, but no treatment often did less harm than heroic therapies. In testing dilutions, Hahnemann also emphasized another advance, very detailed clinical observations of the course of illness. Finally, he strongly advocated preventive medicine—fresh air, bed rest, proper diet, sunshine and public hygiene.

Ironically, homeopathy presented regular medicine with its greatest professional challenge though its practices were the most compatible of all the opposing sects, and regular physicians were the first to convert to homeopathy. But the threat came from homeopathy being the only upper-class sect, arriving from Europe with the approval of the European nobility and upper classes. Some of the best-educated regular physicians in Boston and New York became homeopaths while still considering themselves to be regular physicians. However, homeopathy attacked those sectarian beliefs of regular medicine which had to be taken on faith. This left the regulars no choice but to cast them out. Homeopaths were called "vile pretenders," and the worst transgression was to consult with a homeopath.[45] The AMA code of ethics prohibited consulting with "irregular practitioners."

Another sect of "irregular practitioners" who opposed the damaging drugs used by regular physicians was osteopathic medicine, founded by Andrew Taylor Still (1828–1917).[46] Still began as an apprentice-trained physician in the Midwest but became totally disillusioned by the brutal and deadly effect of regular therapies. He developed a theory of osteopathic lesions, particularly in the spine, that weakened the body and made it susceptible to disease. Correcting the lesions by manual manipulation could directly eliminate some problems and indirectly eliminate others by restoring the body's natural defenses. Still became a charismatic healer, built up a considerable following, and opened the first osteopathic school in 1892. Other schools followed,

43. *Ibid.*, Chapter 7.
44. *Ibid.*, Chapter 8.
45. *Ibid.*, Chapter 12.
46. Based on Norman Gevitz, "The D.O.'s: A Social History of Osteopathic Medicine" (diss. Chicago, 1979); and Gary L. Albrecht and Judith A. Lens, "The Professionalization of Osteopathy: Adaptation in the Marketplace," typescript 1980.

and although osteopathic manipulation was a strange new therapy, osteopathic physicians did not lack patients.

Was the process by which "scientific medicine" gained a monopoly over medical education and practice an elitist take-over or the inevitable result of the first valid system of diagnosis and treatment? The evidence indicates that it was both. On one hand the breakthroughs in anesthesia, antiseptics and bacteriology produced demonstrably superior results to any sectarian approach.[47] On the other hand, the longtime strategy of the medical elite to emphasize scientific learning finally paid off, and they first introduced and promoted these ideas to a skeptical if not hostile audience of regular physicians. Moreover, training in scientific medicine was longer and far more costly (because of labs) than regular training, and this played into the hands of the elite, who were located at the wealthier university medical schools.

For the first time in 1871, Harvard required a graded rather than a repetitive curriculum, and a number of other schools offered the option of a graded curriculum. Harvard also required nine-month terms for each of three years, and as medical schools had feared, this reduced enrollment so that Harvard had to join the University of Michigan in taking the radical step of putting its medical school faculty on salary.[48] Ten schools adopted the compulsory three-year graded curriculum during the 1870s, and 33 more joined them during the 1880s, but the vast majority of schools refused to go along.

Advocates of educational reform also used licensing laws to force the majority of schools to adopt the required, three year curriculum. In 1901, the National Conference of State Medical Examining and Licensing Boards was created and thereby enabled national standards to be set. These included attending a medical school with the three-year compulsory curriculum. This political move by educational leaders took place in the context of rapidly proliferating proprietary medical schools which catered to lower-middle class and working class students. Further pressure came from requirements for lab work and the founding of the Association of American Medical Colleges, which in 1894 required that all members have a four-year graded curriculum plus higher entrance requirements for admitting students. By these moves, reformers sought to reduce the number of students and train them better.

A sound argument can be made that these reforms, which had been tried before, succeeded because for the first time the graduates of the new curriculum had more effective therapies for their patients. With this basic market advantage, the better schools could ignore the proprietary schools, whose graduates could no longer be licensed anyway. The pinnacle of these reforms was, of course, the Johns Hopkins Medical School, whose standards were the highest in the world.[49] It was built around both a new research university and a major hospital, thereby creating the organizational paradigm for medical education to this day.

All these improvements were expensive, and by 1900 medical schools could no longer be self-supporting. This cost increase spelled the death of commercial medical schools. As Abraham Flexner astutely observed in his 1910 report: "Nothing has per-

47. Rothstein, *American Physicians*, Chapters 13 and 14. Stevens, *American Medicine*, Chapters 2 and 3.
48. Rothstein, *American Physicians*, 285.
49. Stevens, *American Medicine*, 66–72.

haps done more to complete the discredit of commercialism than the fact that it has ceased to pay."[50] From a peak of 160 schools in 1903, 51 closed by the year Flexner issued his report in 1910. Abetted by the report and pressure from state medical boards, the decline continued so that by 1920 only 76 schools remained.

Almost all of sectarian medical schools converted or closed as well. The increasingly stringent requirements for medical education, the lack of an effective alternate system of treatment, and decreasing differences between homeopathic and scientific medicine all contributed to the rapid decline of competing models. Ironically, however, one sect which most historians consider too small and rag-tag to include did survive. Osteopathic medicine did offer a distinctly different mode of therapy which it combined with the fruits of scientific medicine. It survived not because it was proven to be scientifically effective but because a sufficient number of customers in the marketplace deemed it to be more effective than scientific medicine.[51] By 1916, the American Osteopathic Association required four-year graded curricula in its schools, and by 1923 it had succeeded in getting 46 states to licence osteopaths, 27 of them with an osteopathic board of examiners.

This account puts the Flexner report in a rather different perspective than is usually offered. For the momentum of fiscal and structural changes was well underway before his study. In its unrelenting drive against schools that did not conform to the new standards of scientific medicine, the medical elite formed a Council on Medical Education in 1904 which initiated investigations of these schools in 1906. However, Arthur Bevan, chairman of the Council, thought these investigations were too lenient, and in 1908 the Carnegie Foundation for the Advancement of Teaching agreed to assess medical schools "guided very largely by the Concil's investigation. ..."[52]

Flexner's report fulfilled every expectation of Bevan and his friends. It tore apart commercial schools with vivid, embarrassing prose. Flexner called Kentucky "one of the largest producers of low-grade doctors in the entire Union"; Chicago "the plague spot of the country"; Bennett Medical College a "stock company practically owned by the dean of the school"; and other schools "dirty" or "utterly wretched." In providing plenty of detail, Flexner used more the language of a political campaign than an objective report. At the same time, he extolled Johns Hopkins as the educational model for a *university* medical school and argued for a large permanent endowment to finance such a model. Bevan and members of his Council had predicted that publicity and approval from the Carnegie Foundation "would assist materially in securing the results we were attempting to bring about." Indeed, the nine largest foundations followed Flexner's recommendations and gave $154 million over the next 24 years to secure the results the Council desired, mostly at the leading private schools.[53] Thus the socially and professionally prominent circle of physicians har-

50. Rothstein, *American Physicians,* 293.
51. *Ibid.,* Chapters 15 and 16. This is the central error made by Rothstein in his analysis of the professions. He fails to recognize that clients remain a key judge of what treatments are "valid."
52. Stevens, *American Medicine,* 66.
53. *Ibid.,* 67; and Howard S. Berliner, "A Larger Perspective on the Flexner Report," *International Journal of Health Services,* 5 (1975), 573–592.

nessed the great fortunes—principally of Carnegie and Rockefeller—to sponsor their concept of medical education and crush competing ideas.

The Hopkins model which Flexner championed has transformed not only medical education but also medical care. The internal structure inevitably led to more specialization, sub-specialization, and research based on the germ theory of disease. As this model spread, it reorganized medical services in its image. The resulting system with its vast surplus of specialists, its expensive focus on hospital care, its fragmentation, its neglect of public health, and its exclusion of working-class students (particularly blacks) are all a logical consequence. Following Flexner, medical education manifests a structural ambiguity between being a training center for physicians who serve the people and being a research center for specialists who investigate the frontiers of medicine. As a rule, faculty attempt to clone themselves.

If the model which the inner circle of medicine had sponsored was the most effective, one would judge its power politics as enlightened self-interest. Without question, the germ theory of disease has proven itself superior to any of the sectarian theories it replaced. But the economic and social costs have been high. And the recent studies showing that clinical medicine made only a small contribution to the decline in mortality from 1900 to 1970 give one pause.[54] It is interesting that at the very time when millions of immigrants and factory workers were living in miserable, disease-producing conditions and when breakthroughs in bacteriology were providing the basis for spectacularly successful public health campaigns, the medical elite chose an educational model that applied those breakthroughs exclusively to the individual organs of individual patients.

Professional Education in Comparative Perspective:

This highly selective study has attempted to highlight some of the social dynamics that shaped modern professional schools in the United States. It raises the question: Do comparable patterns hold in the development of professional and higher education in other countries?

One general theme concerns the disdain of academics towards the practical and the suspicion of professionals towards the academic. The American case adds complexity (which also existed for some branches of medicine in England) by noting that competing sects, particularly in face of little hard data, energetically spun theories as if intellectual abstractions would legitimate their daily work. In contrast, universities moved towards the technical research model of Germany because it promised great economic benefits from pure research. The Germans, it seemed, had somehow taken a similar attitude towards pure theory and research and made it bear very practical fruit.

54. Thomas McKeown, *The Role of Medicine* (Nuffield, 1976). John B. and Sonja M. McKinlay, "The Questionable Contribution of Medical Measures to the Decline of Mortality in the United States in the Twentieth Century," *Milbank Memorial Fund Quarterly*, 53 (1977), 405ff. John B. McKinlay, "Epidemiological and Political Determinants of Social Policies Regarding the Public Health," *Social Science and Medicine*, 13A (1979), 541-558.

When professional schools did join research-oriented universities, both sides somewhat modified their stand. That special corner of a profession which directed training was by definition academic as well and quickly assumed all the attributes of the research academic model. These intricate layers of feeling and action can best be understood as the results of the structural ambiguity in which professional schools find themselves.

Another major theme concerns the relation between the professions and social status. The case for status transfer in the United States is supported by events in England. On one hand, possessors of land, blood and title who made up the old elite needed to transpose their status to a new key, and the professions provided a modern status and sphere of work in which they could use their advantages to excel. Moreover, they worked energetically to elevate their professional status still further. On the other hand, the professions were a way for the new industrialists to convert their millions into a high-status enterprise. Although space prevented the discussion of the legal profession, a similar process also occurred there as the center of the profession shifted towards specialists in corporate and tax law.

Finally the relation between the state and the professions is contradictory. It appears that in the absence of strong state control (as in Germany), professional associations arose to serve similar functions of organization and regulation. In this case, professional leaders used the state's powers to control competitors and promote their own exclusive interests. But participation by the state did not necessarily reduce exclusiveness or inequity. Often it supported them. This is particularly the case with American medical education, where professional leaders and the state worked together to make medical education less available and more exclusive during a period of great diversification in the rest of higher education.[55]

55. The growing importance of the professions in American society is evident in the increase of the professional/technical share of all occupations from 4.3% to 7.5% between 1900 and 1940. Larson, *The Rise of Professionalism.*

List of Contributors

Patrick Alston, Professor of History at Bowling Green State University (Ohio), has written on *Education and the State in Tsarist Russia* (Stanford, 1969) and is the co-editor of the *Slavic and East European Education Review.*

Richard Angelo, Assistant Professor of Education at the University of Kentucky, has worked on "The Students at the University of Pennsylvania and the Temple College at Philadelphia", *History of Education Quarterly,* Summer 1979, 179–205.

Daniel Brower, Professor of History at the University of California-Davis, has published on the French Communist Party and the Popular Front as well as on *Training the Nihilists: Education and Radicalism in Tsarist Russia* (Stanford, 1969).

Colin B. Burke, Associate Professor of History at the University of Maryland Baltimore-County, has just finished a major work on *American Collegiate Populations* (New York, 1982).

John E. Craig, Associate Professor of Education at the University of Chicago, has recently completed a massive work on *Scholarship and Nation-Building: The Universities of Strasbourg and Alsatian Society, 1870–1939* which is in press with the University of Chicago Press.

Arthur Engel, Associate Professor of History at Virginia Commonwealth University (Richmond), has written on Victorian social history such as *From Clergyman to Don: A Study of the Rise of the Academic Profession in 19th Century Oxford* (Clarendon Press, 1982).

Jurgen Herbst, Professor of History and Educational Policy Studies at the University of Wisconsin, has written widely on American higher education such as on *The German Historical School in American Scholarship* (Ithaca, 1965) and on *From Crisis to Crisis: American College Government 1636–1819* (Cambridge, 1982).

Konrad H. Jarausch, Professor of History at the University of Missouri, has written broadly on German history such as on *The Enigmatic Chancellor: Bethmann Hollweg and the Hubris of Imperial Germany* (New Haven, 1973). His most recent book is on *Students, Society and Politics in Imperial Germany: The Rise of Academic Illiberalism* (Princeton, 1982).

Donald Light, Professor of Community Medicine at the New Jersey School of Osteopathic Medicine, has written widely on the sociology of the American academic

profession and has just published *Becoming Psychiatrists: The Professional Transformation of Self* (New York, 1980).

Roy A. Lowe, Senior Tutor in the Faculty of Education of the University of Birmingham (England), has co-authored a book on *The English School: Its Architecture and Organization 1870–1970* and edits the *Occasional Publications* of the British History of Education Society.

Peter Lundgreen, Professor of History at the University of Bielefeld (West Germany), has published on technical education such as *Techniker in Preußen während der frühen Industrialisierung* (Berlin, 1975), and recently produced a *Sozialgeschichte der deutschen Schule im Überblick* (Göttingen, 1980), 2 vols.

Charles E. McClelland, Professor of History at the University of New Mexico (Albuquerque), has written on *German Historians and England* (Cambridge, 1971), and most notably on *State, Society and University in Germany, 1700–1914* (Cambridge, 1980).

James McClelland, Associate Professor of History at the University of Nebraska (Lincoln), has worked on the proletarianization of the student body in Soviet Russia and on *Autocrats and Academics: Education, Culture and Society in Tsarist Russia* (Chicago, 1979).

Harold Perkin, Professor of History at the University of Lancaster (England), has written prolifically on British social history. Among his most important titles are *The Origins of Modern English Society, 1780–1880* (London, 1969) and *The Key Profession: A History of the Association of University Teachers* (London, 1969).

Sheldon Rothblatt, Professor of History and co-director of the Center for the Study of Higher Education at the University of California-Berkeley, is the author of *Revolution of the Dons* (New York, 1968) as well as of *Tradition and Change in English Liberal Education* (London, 1977).

Charles E. Timberlake, Professor of History at the University of Missouri, has written on a variety of Russian topics such as detente, but is primarily interested in the zemstvo movement. He has edited *Essays on Russian Liberalism* (Columbia, 1972).

Hartmut Titze, *Hochschulassistent* at the pedagogical seminar of the University of Göttingen (West Germany), has worked on the sociopolitical function of education in *Die Politisierung der Erziehung* (Frankfurt, 1973) and is currently studying the relationship between enrollment and the academic job market.

Selective Index

Compiled by Daniel Dussel
(Including major educators, institutions, countries and concepts)